REGION 5 RAC2

REMEDIAL ACTION CONTRACT FOR

Remedial, Enforcement Oversight, and
Non-Time Critical Removal Activities at Sites of Release
or Threatened Release of Hazardous Substances in Region 5

DRAFT PROJECT QUALITY MANAGEMENT PLAN

Remedial Design

South Minneapolis Residential Soil Contamination Site
Minneapolis, Minnesota

Milwaukee, Wisconsin
WA No. 047-RDRD-B58Y/Contract No. EP-S5-06-01

May 2009

PREPARED FOR

U.S. Environmental Protection Agency

PREPARED BY

CH2M HILL
Ecology and Environment, Inc.
Environmental Design International, Inc.
Teska Associates, Inc.

FOR OFFICIAL USE ONLY

DRAFT PROJECT QUALITY MANAGEMENT PLAN

SOUTH MINNEAPOLIS RESIDENTIAL SOIL CONTAMINATION SITE
Minneapolis, Minnesota

Remedial Design

WA No. 047-RDRD-B58Y/Contract No. EP-S5-06-01

May 2009

Contents

Figures

Table

Appendices

Abbreviations and Acronyms

AHA	Activity Hazard Analysis
CCO	contract change order
CDF	Confined Disposal Facility
CQC	Construction Quality Control
CQMM	Construction Quality Management Manual
DFOW	definable feature of work
FS	feasibility study
ft^2	square foot
HASP	Health and Safety Plan
HHRA	human health risk assessment
HI	hazard index
KA	Contract Administrator
Lite Yard	CMC Heartland Lite Yard property
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
mg/kg	milligrams per kilogram
MnDOT	Minnesota Department of Transportation
PA	project accountant
ppm	parts per million
PQMP	Project Quality Management Plan
PRG	preliminary remediation goal
QA	quality assurance
QC	quality control
RA	remedial action
RCRA	Resource Conservation Recovery Act
RFI	request for interpretation
RI	remedial investigation
ROD	Record of Decision
SMRSCS	South Minneapolis Residential Soil Contamination Site
SSO	Site Safety Officer
USEPA	United States Environmental Protection Agency
WBS	work breakdown structure

Glossary

Construction Quality Management Manual (CQMM)— Describes the quality systems and processes that are required to be implemented on contracts and projects executed by the Environmental Services Business Group's (ESBG's) Construction Operations, including on Design/Build and At-Risk construction projects. The quality systems and processes have been put into place in order to manage the risks and liabilities of the company, to ensure the quality and consistency of construction projects executed throughout the ESBG, and to provide our clients with products and services that meet or exceed their expectations at an acceptable cost and within budget.

Project Quality Management Plan (PQMP)— Establishes the guidelines and requirements to be used for project delivery to meet client objectives and achieve CH2M HILL standards. The primary objective of the Project Quality Management Plan is to document requirements, procedures and methodology for quality assurance and control during construction of each ESBG project. The PQMP will be finalized during the remedial action (RA) upon determination of Contractor personnel and Subcontractors.

Quality Assurance (QA)— Refers to the overall quality process. It is the assurance that the construction effort is conducted in a manner consistent with the design.

Quality Control (QC)— Refers to a planned system for monitoring, controlling and documenting the quality of materials, supplies, and workmanship in a manner consistent with the execution plan and the drawings and specifications. These are the active tasks associated with quality management.

Project Instructions— Provides management instructions for construction operations, documentation and reporting for work to be performed. The instructions provide guidance to the project team and clarify Site Manager expectations regarding personnel assignments, responsibilities, accountability, project goals, direction, processes and procedures through the construction phase of the project. The project instructions define parameters for the implementation of the PQMP.

Contract-Required Submittals— Such as project plans, including Sampling and Analysis Plans, Health and Safety Plans, design drawings and specifications, reports, and as-built records will be clearly identified during the proposal phase of the project. Contract-required submittals are items that are submitted to the customer and stakeholders for review and approval prior to and following construction activities.

Construction Quality Submittals— Submittals generated during or immediately prior to construction to demonstrate compliance with the project plans, drawings, and specifications. Construction quality submittals include daily reports, shop drawings, schedules, sample documentation, calibration records, photographs, product data, samples, field change request documentation, administrative and close-out submittals, and additional technical support data presented for review and approval.

1. Introduction

1.1 Purpose

The purpose of the Project Quality Management Plan (PQMP) is to provide the quality processes and procedures required for the South Minneapolis Residential Soil Contamination Site (SMRSCS) remedial action project located in Minneapolis, Minnesota. These procedures and processes are consistent with the requirements of the contract/agreement with the client. These procedures and processes are derived from the Construction Quality Management Model (CQMM) and CH2M HILL's core quality standards.

CH2M HILL, Inc. (CH2M HILL) has been contracted by USEPA for the work performed under Contract No. EP-S5-06-01, WA No. 047-RDRD-B58Y. When this document references CH2M HILL, it should be construed to mean CH2M HILL and its subcontractors as their respective trade may apply to the subject being discussed.

1.2 Project History/Background

The SMRSCS is located in Minneapolis, Hennepin County, Minnesota. The SMRSCS consists of the residential properties within the approximate 3/4-mile radius from the CMC Heartland Lite Yard (Lite Yard) property. An aerial dispersion model performed by USEPA serves as the boundary for the SMRSCS.

The SMRSCS encompasses residential, industrial, commercial, and municipal properties, approximately 2 miles southeast of downtown Minneapolis. The SMRSCS is a largely residential area with most commercial and industrial areas to the east of the former Lite Yard property. Most of the residences were built from the early 1900s through 1930s. The residential areas of the SMRSCS consist primarily of residences on grassed lots. Commercial and industrial areas typically have little open ground and consist of mainly asphalt or concrete and buildings. Arsenic contamination was discovered by the Minnesota Department of Transportation (MnDOT) in 1994 during reconstruction of the Hiawatha Avenue corridor adjacent to the Lite Yard property. After the arsenic contamination was identified in 1994, an additional investigation was performed at the Lite Yard property. By 1996, Bituminous Roadways had placed 1 to 2 feet of crushed asphalt over the Lite Yard property to prevent dust from blowing offsite and to minimize human exposure to surface soil (Geomega, 2004). The Lite Yard property was a state Superfund site and remedial actions were performed at the Lite Yard property in 2004 and 2005. The Lite Yard property has since been redeveloped. At present, the Lite Yard property is owned by 2800 Hiawatha, LLC and occupied by the Hiawatha Business Center, an approximately 60,000-square foot (ft^2) light industrial building (Peer, 2005).

As a result of the investigations at the Lite Yard property, the Minnesota Department of Health (MDH) recommended in 1999 that soil sampling be performed in residential areas near the Lite Yard property due to the potential for elevated arsenic concentrations. It was determined that the prevailing summer winds were from the southeast toward the

northwest; therefore, the residential area located directly downwind of the Lite Yard property became the focus of the sampling effort (USEPA, 2005a). Investigations in the residential neighborhood performed by the MDH and Minnesota Department of Agriculture (MDA) identified arsenic impacts in the shallow soils. The MDA requested assistance from USEPA in 2004 after sampling efforts in the residential neighborhood identified properties with elevated arsenic concentrations. USEPA subsequently performed investigations of the residential properties, schools, and parks in the SMRSCS in 2004 and 2005, undertook removal actions at the most highly contaminated properties, and initiated a remedial investigation (RI) in 2006. Through the RI and previous investigations, over 3,500 residential properties, schools, daycares, and parks were sampled within the SMRSCS.

Removal actions were performed at the most highly contaminated residential properties where surface soil concentrations were greater than 95 milligrams per kilogram (mg/kg). The removal actions consisted of excavation of 12 inches of soil in yards and 18 inches in gardens. Samples were collected from the bottom of the excavation and sent to the lab for analysis to document the remaining arsenic concentration. The excavation was backfilled to the original grade and restored.

As a part of the RI, a human health risk assessment (HHRA) was performed to evaluate the health risks to residents. The HHRA presented in the *RI Report* calculated a risk-based preliminary remediation goal (PRG) of 25 mg/kg for arsenic in soil, which correlates to a 1×10^{-4} risk level and hazard index (HI) of 1. A feasibility study (FS) for the SMRSCS was completed in 2008 to develop and evaluate remedial alternatives for addressing human health risks from arsenic in soils at the SMRSCS. On September 5, 2008, USEPA, working with the MDA and MDH, selected a remedy for the SMRSCS that was finalized in the Record of Decision (ROD).

The major components of the selected remedy, as presented in the ROD, include the following:

- Inventory and documentation of the existing conditions of the areas requiring the remedy.
- Excavation of soil (to a depth of 12 inches below grade in yards, and to a depth of 18 inches below grade in garden areas) that has total arsenic concentrations above 25 mg/kg, or parts per million (ppm).
- Post-excavation soil sampling to document the concentrations in the remaining soil.
- If the samples at the base of the excavation exceed the deep soil arsenic cleanup standard, 95 mg/kg, then excavation will continue until the deep soil cleanup standard is met, or to a maximum depth of 10 feet.
- Placement of a permeable and permanent high visibility marker layer and detectable, high visibility, red underground marking tape, in the bottom of the excavation where soils above 95 mg/kg remain. The marker layer will provide a visual barrier over soils that were not excavated during the remedial actions and may contain residual contamination above the deep soil cleanup standard.
- Backfilling excavation with clean fill and topsoil to the original grade.

- Restoration of the excavated areas (i.e., restoring vegetation by seeding the final graded surface and planting replacement plants identified prior to excavation during an inventory).
- Collecting samples from excavated soil to verify that the soil is not characteristically hazardous and may be transported to, and disposed of at, a permitted and compliant Resource Conservation Recovery Act (RCRA) Subtitle D landfill. Soil has not been found to be characteristically hazardous during interim removal actions and so handling and disposal of RCRA hazardous waste is not anticipated to be required for this remedial alternative. However, if soil is characteristically hazardous, the soil may be managed as follows:
  - Stabilized and solidified at a centralized offsite treatment area prior to disposal at a RCRA Subtitle D landfill, or
  - Transported and disposed of as characteristically hazardous waste at a RCRA Subtitle C landfill.
- If cleanup standards are not obtained at the bottom of the excavation, institutional controls would be placed on the land in the form of use restrictions to define areas of remaining concern, or zoning and permit requirements to limit exposure.

1.2.1 Project Goals/Objectives

- Identifying the project participants and organizational structure
- Defining participants' responsibilities and authorities
- Outlining project communication
- Ensuring consistent documentation format
- Establishing general quality assurance (QA) requirements for various project elements
- Establishing quality levels and requirements
- Establishing project closeout guidelines

The appendixes present QA requirements that relate to specific elements of construction and the forms that will be used during construction to document QA activities.

1.2.2 Definable Features of Work

A definable feature of work (DFOW) is a task that is separate and distinct from other tasks and has separate control requirements. The RA is anticipated to occur over three construction seasons with the DFOWs applying to each season. The following are DFOWs for the project:

- Mobilization and staging area site preparation (including temporary facilities, fence and gates)
- Residential preconstruction meetings
- Preconstruction surveys
- Residential property site preparation, including clearing and grubbing, fence removal, offsite storage

- Excavation
- Post-excavation survey
- Backfill and compaction
- Landscaping
- Site restoration
- Post-construction surveys
- Landscape maintenance
- Post-construction meetings and substantial completions
- Project substantial completion milestone
- Decontamination and demobilization

1.2.3 Limitations

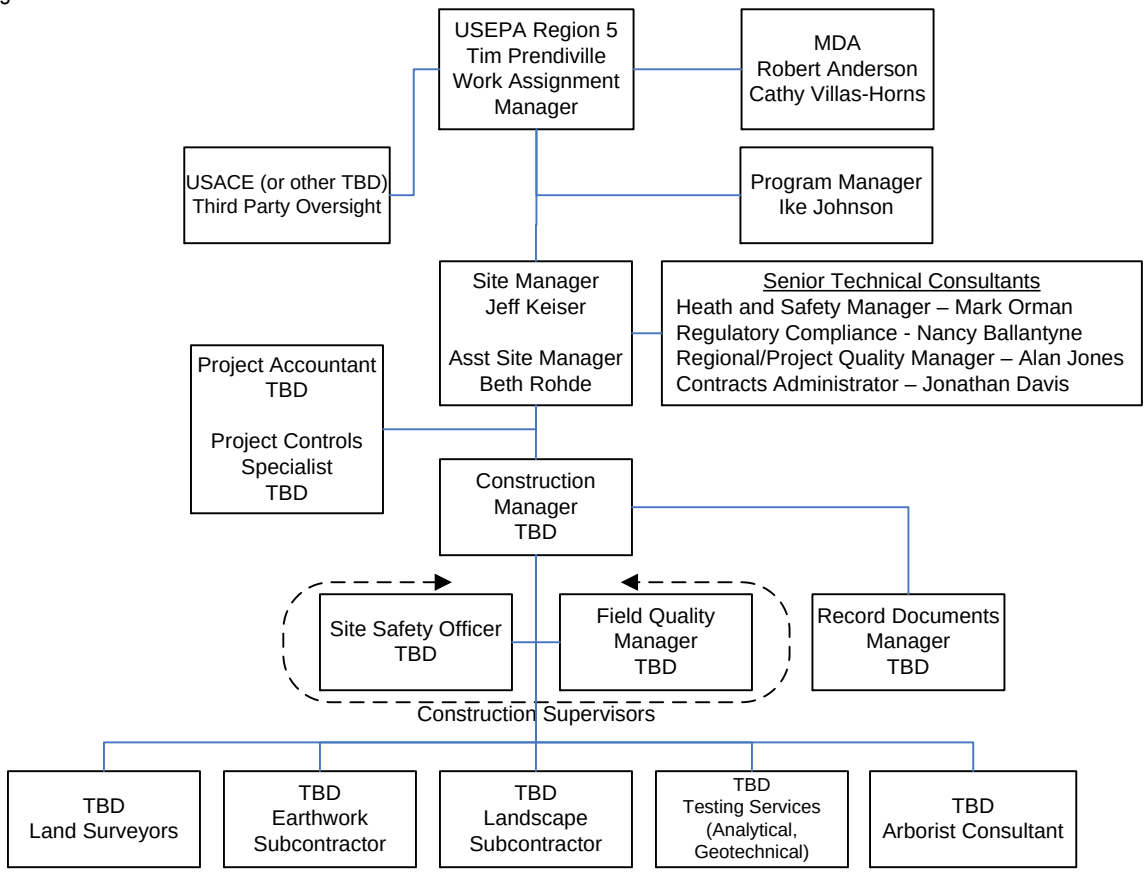
This PQMP has been prepared for the exclusive use of CH2M HILL for specific application to the SMRSCS RA.

2. Responsibilities and Authority

2.1 Organizational Structure

The organizational structure for the South Minneapolis Residential Soil Contamination Site Remedial Action is shown in Figure 1. Key parties include the United States Environmental Protection Agency (USEPA), the Minnesota Department of Agriculture (MDA), United States Army Corps of Engineers (USACE) and CH2M HILL. CH2M HILL, as Prime Contractor to USEPA, is subcontracting portions of the work to qualified subcontractors.

FIGURE 1
Organizational Structure



2.2 Responsibilities

2.2.1 USEPA

USEPA is responsible for the overall execution of the project. USEPA will retain independent QA, and construction organizations to accomplish the work, and will have the authority to hire and fire these organizations. USEPA has the authority to accept or reject

QA plans, reports, and recommendations of CH2M HILL, and the materials and workmanship of subcontractors. The USEPA is referred to within the contract documents as the Owner.

2.2.2 MDA

The USEPA may consult with the MDA to perform document review and participate in project meetings as necessary.

2.2.3 USACE (or Other TBD)

The USACE will perform third party oversight on behalf of the USEPA with document review and field inspections, as necessary.

2.2.4 CH2M HILL's Site Manager

CH2M HILL's Site Manager is directly responsible for both the construction contract administration and the management of all phases of the project. The Site Manager provides and maintains qualified project staff, monitors and controls the budget, and is the primary contact with USEPA on contractual matters. He or she acts as a liaison and is in direct communication with the Construction Manager. The Site Manager will review nonconformance reports submitted by the Construction Manager and determine appropriate action.

The Site Manager is responsible for implementation of the PQMP. The project team members will be provided clear understanding of their project roles and responsibilities. The Site Manager will charter the team to outline expectations for execution communication and reporting to meet contract and project requirements. The global quality-related responsibilities of the Site Manager may include, but are not limited to, the following:

- Organizing project staff and assignment of responsibilities
- Understanding contract and scope of work for the project
- Ensuring that required submittals are completed and submitted, as required in the contract
- Communicating client requirements and quality practices to the project staff
- Providing final review and approval of change and claim management proposals and decisions, documentation, and notification to the client and project team of changes in the scope of work, design/engineering specifications and drawings, project documentation, and activities
- Conducting financial management, including review approval and processing of invoices and managing internal financial reporting
- Supervising the preparation and approval of project-specific procedures, project plans, and design/engineering specifications and drawings
- Serving as a liaison for communications with the client and subcontractors

- Serving as a liaison for communications between the project staff and other internal groups
- Serving as final reviewer prior to release of project information
- Approving and signing outgoing correspondence

The Site Manager may assign a part of these responsibilities to other team members, who will remain onsite throughout project field activities.

2.2.5 Project Quality Manager

The Project Quality Manager is responsible for ensuring implementation of the quality program within the region or program. This responsibility includes verification of the effectiveness of the program and project quality assurance. The Project Quality Manager will also conduct periodic review of activities under the guidance of this PQMP, performing periodic surveys and audits of the processes being implemented, evaluating any recommendations made by the project team over the course of the project regarding use of the processes, and implementing continuous improvement evaluations of the quality program.

2.2.6 Health and Safety Manager

The Health and Safety Manager for the project is responsible for review and edit of the Health and Safety Plan (HASP) to be included in the contract documents. The Site Manager coordinates involvement during design to ensure compliance is achievable. The Health and Safety Manager conducts health and safety audits during the project to assure the HASP is supported by the project team.

2.2.7 Contract Administrator (KA)

The KA will assist the team with contractual arrangements. The KA is responsible for ensuring procurement is conducted in accordance with the CH2M HILL protocol for subcontracting. The KA will assist with evaluating subcontractors/vendors payment applications for processing. The KA will also be involved with change order administration and management of subcontractor(s)/vendors subcontracts and issuance of formal changes. In addition, the KA will ensure the potential subcontractor/vendor proposals contain appropriate rates and have adequate documentation.

2.2.8 Project Accountant (PA)

The Project Accountant will assist in matters concerning budgets, invoices, percent completes, estimates at complete, and individual project financial report formats. The Site Manager will work with the PA to set up the initial budgets. The Site Manager is to keep the PA informed of contract change orders (CCOs)/purchase order amendments and distribution of funds across project numbers. The project accountant is also responsible for reviewing all travel expenses are in accordance with the project budget.

2.2.9 Project Controls Specialist

The Project Controls Specialist will perform project control activities during performance of the work. Project control activities include development and maintenance of schedule and budget data for reports, assistance with preparing work breakdown structures (WBS), development of the WBS budget data (including resource loading) for those WBS elements as required, and assistance with preparing status reports, tracking the subcontractor schedule of values, and other related project report and control documentation.

2.2.10 Construction Manager

CH2M HILL's Construction Manager is responsible for the field administration of the construction contract requirements during construction and has the authority to stop work and require corrections in a timely manner. The Construction Manager performs field observation duties and directs the field technical staff. He or she provides liaison and is in direct communication with the subcontractor and the CH2M HILL design team. The Construction Manager is also responsible for implementing the PQMP and advising the Site Manager and USEPA of QA and construction-related issues that may affect the proper execution or quality of the work.

Specific prebid duties performed by the Construction Manager include the following:

- Performing a constructability review of the design
- Attending the prebid meeting and assisting design staff in preparation of addendums resulting from the prebid meeting
- Conducting subcontractor prequalification
- Opening and evaluating construction contract bids
- Preparing Recommendation of Award

Construction-specific duties performed by the Construction Manager are as follows:

- Establishing a site field office including communication and filing systems and other necessary office equipment
- Reviewing subcontractor schedules
- Preparing and conducting orientation sessions for project personnel
- Receiving, reviewing, processing and when appropriate, approving subcontractor submittals. Ensuring required submittals are accurate and complete as required in the contract before forwarding to designated reviewers
- Identifying and managing change issues, providing weekly documentation, and notifying the Site Manager and project team of changes in the scope of work, design/engineering specifications and drawings, project documentation, and activities.
- Providing cost monitoring, tracking, and weekly subcontractor updated schedule of values for accruing project costs

- Reviewing subcontractor's monthly payment requests and forwarding the requests to the Site Manager for approval
- Interpreting the technical content of the drawings and specifications with respect to deviations from them or to requests for clarifications
- Providing USEPA with a detailed monthly construction status report, containing construction photographs and weekly logs

Specific construction QA duties performed by the Construction Manager include the following:

- Supervising and coordinating with the daily activities of the subcontractor and recording of activities and progress in daily reports
- Submitting nonconformance reports and other QA documents to the Site Manager and USEPA
- Documenting the resolution of inadequacies noted in nonconformance reports
- Establishing location, time, and frequency sampling criteria for verification testing to be performed by the Construction Managers or by independent testing companies
- Reviewing results of subcontractor-submitted QC tests for compliance with subcontract requirements
- Reviewing daily inspection reports and test data for completeness
- Conducting weekly progress meetings, and preparing and distributing meeting notes discussing progress, problem areas, and status of long-lead items
- Advising the Site Manager of conditions that may affect satisfactory completion and quality of work
- Providing adequate training of QA and support personnel
- Ensuring document management guidelines are implemented in the field

2.2.11 Field Quality Manager

The Field Quality Manager is an individual assigned by the Site Manager, with concurrence from the Regional Quality Manager, to implement and manage the site-specific quality assurance/quality control (QA/QC) requirements in accordance with the PQMP. The Field Quality Manager will be trained and experienced in performing inspections, surveillance, testing, and other QC requirements, as required in the PQMP. The Field Quality Manager may be assigned other project duties, as qualified, such as Site/Construction Manager, Project Engineer, Health and Safety Coordinator, etc. In such cases, that person will be responsible for the quality of work on the job.

The Field Quality Manager will review the PQMP and become familiar with project requirements. The Field Quality Manager will assist and represent the Project Quality Manager in continued implementation of the project plans. This position requires a thorough understanding of construction, remediation, as well as a clear understanding of the project's inspection and documentation requirements. The Field Quality Manager is

responsible for: conducting submittal reviews, oversight and coordination of all testing activities, certifying the appropriate aspects of QC activities, and attending and preparing notes for the weekly status meetings and the Coordination Meeting. The Field Quality Manager carries tremendous responsibilities and serves a critical role in the successful performance of the project quality requirements.

Therefore, it is essential that the Field Quality Manager be on the site at all times when construction is performed on the project. In his/her absence, the Field Quality Manager is responsible for designating an alternate Field Quality Manager and obtaining concurrence from the Site Manager and the Regional Quality Manager.

Throughout the construction activities, the Field Quality Manager is responsible for, at a minimum, the following:

- Performing inspection activities for DFOWs
- Confirming utility clearance is completed prior to intrusive work being performed
- Verifying that proper signs are installed and that roads are maintained and can accommodate construction traffic
- Inspecting all delivered materials
- Monitoring delivery, handling, and storage of materials per the specifications
- Reviewing manufacturer material certifications
- Ensuring that subcontractor and project team members have the required qualifications, training licenses, and certifications
- Ensuring control testing is performed in accordance with the specifications, drawings, and project plans
- Documenting all quality activities
- Ensuring that nonconforming items are corrected or addressed through Requests for Information (RFIs)
- Performing audits and surveillance of project activities, as necessary, to ensure the quality of service, product, and workmanship meets the requirements of the project

The Field Quality Manager will also coordinate with and assist the Regional Quality Manager in the performance of quality audits and inspections.

The Field Quality Manager has the authority to stop work on all or any project work activity due to nonconformance with the PQMP, project plans, specifications, and drawings. Onsite personnel will be encouraged to discuss concerns with the Field Quality Manager and supporting technical personnel. In the event that the Field Quality Manager is informed of and/or detects an incident of project nonconformance, the Field Quality Manager will perform an initial investigation, evaluate the course of corrective action required, document the incident, and report the incident to the Construction Manager, Site Manager, and Regional Quality Manager.

2.2.12 Site Safety Officer

The Site Safety Officer (SSO) for the project will be responsible for providing direction on health and safety at the site. Health and safety is a team function, and not only is compliance required, excellence is expected.

The SSO will be responsible for and has the authority to perform the following:

- Lead daily tailgate meetings
- Perform safety inspections
- Verify training records for new employees coming onsite
- Air monitoring

2.2.13 Technical Lead

For some tasks of this project, the technical lead will be responsible for and has the authority to perform the following:

- Establish critical inspections for design-related work
- Establish submittal requirements
- Review and approve technical submittals
- Review and approve technical changes to project documents
- Review and approve Requests for Information or Design Change Notices
- Conduct a site visit to review means and methods of implementing remedial technology
- Review confirmatory laboratory test results and compliance with contract requirements
- Review and approve technical reports

2.2.14 Document Manager (DM)

The Document Manager (DM) responsibilities include the following:

- Tracking document status through software programs such as Microsoft Excel, Access, Primavera Expedition, etc.
- Implementing the document control processes
- Implementing the document management processes
- Archiving documents and records

2.2.15 Subcontractors

CH2M HILL has overall responsibility for conformance to the quality requirements of the project. However, it is the responsibility of each subcontractor to plan, manage, complete all quality requirements, and accomplish his activities in accordance with the subcontract requirements.

Vendors, Independent Test Companies, and Third Tier Subcontractors

These entities are agents of the respective subcontractor by way of subcontracts, sub-subcontracts, or similar arrangements. As such, they are responsible, through the subcontractor, for maintaining QC procedures in accordance with their contractual arrangements and the subcontractor's QC plans. These agents should also provide the subcontractor with QC data and reports necessary for the agent's submittals to the Site Manager.

3. Project Communications

3.1 Lines of Communication

Accurate and timely communication is required to avoid construction-related conflicts and potential errors and omissions. USEPA, CH2M HILL, subcontractors, and their respective employees and staff will have an established communication network as shown in the organization chart (Figure 1). Establishing open lines of communication is essential for maintaining strong working relationships and producing quality work.

The primary lines of communication between key project parties are shown in the Figure 1. Project-specific personnel and lines of communication will be discussed and established by all parties at the preconstruction meeting. The discussion will include the following:

- Communication procedures between supervisory and field staff
- Direct communication procedures between key parties for specific issues and situations
- Procedures and restrictions for secondary lines of communication within the project organization
- Procedures for information transfer and confirmation between the various parties
- Procedures for documentation of all communications
- Format and distribution for meeting notes, reports, submittals, etc.

Communication will be documented with each party receiving a copy of such documentation (e.g., telephone memorandums, meeting notes). Copies will be routed to other parties if they should be aware of the situation (e.g., problem, change, agreement).

Document control procedures will be established for items such as subcontractor submittals, test results, and plan or specification revisions. These controls will include distribution and confirmation procedures to verify that documents are appropriately dispatched and incorporated into the project. Whenever possible, documents indicating revisions in plans, specifications, or procedures will be distributed immediately and explained to all parties at routine or special project meetings.

3.2 Project Meetings

Project meetings will be scheduled to promote communication between various personnel responsible for designing, constructing, managing, and observing the construction. The purpose of the routine project meetings is to keep all parties informed and provide a forum for solving design, construction, and QA problems.

3.2.1 City of Minneapolis Meeting

The Site Manager will schedule and administer a meeting with the City of Minneapolis, USEPA, MDA, and the Earthwork Subcontractor before construction begins. The purpose of the meeting is to obtain input and information from the City to complete planning documents. At a meeting with the City, the contractor will discuss the following:

- Transportation routes
- Direct loading plans
- USEPA exempt permits
- Required licenses
- Allowable work hours
- Use of city water
- Street closings and logistics
- Street and alley closing restrictions
- City debris pickup
- Special requirements and considerations

3.2.2 Preconstruction Conference

The Site Manager will schedule and administer a preconstruction conference that will be held in Minneapolis, Minnesota prior to issuance of the Notice To Proceed and prior to start of construction at the site. The exact date and time will be determined at the time of contract award. During the conference, ground rules and understandings are established between the project stakeholders. The purpose of this meeting is to ensure that parties involved in the project understand the statement of work, schedule, submittal requirements, documentation requirements, change management processes and procedures, construction means and methods, reporting and communication requirements, H&S requirements and protocols, etc. Attendees will include USEPA representatives, MDA representatives, contractor representatives, subcontractor's Project Manager, subcontractor's resident superintendent, subcontractor's quality control representative, subcontractor's representatives whom subcontractor may desire or contractor may request to attend, and others as appropriate.

The Site Manager shall be prepared to discuss the following subjects, at a minimum:

- Required schedules
- Status of bonds and insurance
- Sequencing of critical path work items
- Progress payment procedures
- Project changes and clarification procedures

- Use of site, access, office and storage areas, security and temporary facilities
- Subcontractor's health and safety plan and representative
- Status of permits, license or required approvals
- Status of submittals
- Maintaining required records
- Job Hazard Analysis
- Subcontractor key personnel information and points of contact for 24 hours per day, 7 days per week
- Subcontractor QA/QC Plan.

The Construction Manager and Site Manager will prepare meeting notes and distribute them to the meeting participants.

3.2.3 Preliminary Schedule Review Meeting

A Preliminary Schedule Review Meeting will be conducted at the time of the preconstruction meeting. The schedule will satisfy the requirements of specifications Section 01 31 19, Part 1, Project Meetings. Five days before the preconstruction meeting, the subcontractor will submit for contractor review a detailed progress schedule beginning with notice to proceed and continuing through final completion. When accepted by the contractor, the detailed progress schedule will replace the preliminary progress schedule submitted with the bid and become the baseline schedule. Subsequent revisions will be considered updated progress schedules.

3.2.4 Community Relations Meetings

One public meeting will occur before mobilization begins. Up to two (2) public meetings will be held during each construction season to present progress made. Public meetings will be held within the boundaries of the South Minneapolis site when possible. Contractor will arrange for meeting venue, advertise for meetings, and prepare meeting materials.

3.2.5 Daily Tailgate Meetings

Daily tailgate meetings will be conducted every workday morning. Attendees required for the meeting will be discussed at the preconstruction meeting. The designated personnel (including lower-tiered subcontractors) shall attend these meetings. Documentation of the meeting shall be provided to the contractor by 10 a.m. that same day. At a minimum, the following subjects will be discussed:

- Work planned for the day
- Changes in work assignment
- Health and safety issues
- Quality issues
- Successes/problems encountered the previous day
- Review and signing of the pretask safety plan before beginning work onsite for the day

3.2.6 Weekly Progress Meetings

After the start of site work and throughout project execution, the Construction Manager will conduct weekly progress meetings at the site to review construction progress, progress schedule, sample collection and submissions schedule, contract modifications, and other matters that require discussion and resolution. The Construction Manager, site safety officer, field quality manager, and subcontractor representatives will attend the meetings, as appropriate. Project stakeholders may attend these meetings. The following tasks will be accomplished at each meeting:

- Review the notes of the previous meeting.
- Review the schedule:
  - Work or testing accomplished since last meeting
  - Rework items identified since last meeting
  - Rework items completed since last meeting
  - Schedule delays and long lead time items
  - Critical milestones
- Review the status of submittals:
  - Submittals reviewed and approved since last meeting
  - RFI resolutions
  - Submittals required in the near future
- Review the work to be accomplished in the next 2 weeks and documentation required:
  - Establish completion dates for rework items
  - Inspections required
  - Testing required
  - Status of offsite work or testing
  - Documentation required
- Discuss health and safety issues, for example, near-misses, incidents
- Resolve quality issues, for example, nonconformance, rework, corrective actions
- Resolve production problems
- Address items that may require revising the PQMP or other project plans
  - Changes in procedures
  - Changes in design/engineering drawings or specifications
  - Changes or claims for additional compensation or time

Meetings will be recorded in project status meeting notes prepared by the field quality manager. The notes will be attached to the daily report. The meetings may be held in conjunction with tailgate safety meetings, progress meetings, planning meetings, or others.

3.2.7 Residential Preconstruction Meetings

An initial residential preconstruction meeting will be conducted with the property owners several weeks before mobilization to the property to discuss schedule, access, remediation, removals, restoration, and security. During the preconstruction meeting, a copy of the construction drawings will be provided. The contractor will coordinate and lead the meetings with the property owners and if possible, the residents, and Earthwork subcontractor. Meetings may be scheduled outside of normal working hours and on weekends to accommodate the property owners' schedules. All parties will be required at

all meetings until details are concluded. Details will include video/photo documentation of preconstruction conditions, an inventory of property to be relocated and mark-up of construction drawings for current property features. If plants are located within the excavation area, the contractor will coordinate with the Landscaping Subcontractor to identify the plants after the initial property meeting and prepare a plant inventory prior to the second Preconstruction Meeting.

A second Preconstruction Meeting shall be performed within approximately 1 week of mobilization to the property. The Contractor and Earthwork Subcontractor will meet with the property owner and resident, if necessary, at the property to confirm the sketch, made during the first site visit and converted into AutoCAD or a similar format. The property inventory list will also be confirmed and the current property owner will be given a copy of the photo documentation taken during the initial Preconstruction Meeting. During the meeting, a Property Owner Agreement – Residential Preconstruction Checklist will be completed and special provisions noted. At the conclusion of the second Residential Preconstruction Meeting, the property owner, the Contractor, and the Earthwork Subcontractor will all sign the Property Owner Agreement and the final sketch authorizing the work to be performed at that property.

3.2.8 Residential Post-construction Meetings

Residential post-construction meetings will be conducted with property owners and the Residents, if appropriate, following completion of restoration to review acceptability of completed work and to develop punch list items as required. During the meeting, a copy of the edited survey notes and construction drawings will be reviewed showing information gathered during the Residential Preconstruction Meetings. Contractor will coordinate and lead the meetings with the property owner, Earthwork Subcontractor and Landscaping Subcontractor in attendance at the property address. Meetings may be scheduled outside of normal working hours and on weekends to accommodate the property owner's schedule. The restored work will be documented by the contractor using photographs and video.

A final inspection will be performed in a second meeting with the property owner after the residential post-construction meeting and completion of punch list items for that property. Final inspections will be scheduled on predetermined days each month with the Contractor, USEPA representative, and property owner in attendance. At the conclusion of the final inspection, the property owner will be asked to sign the Property Owner Agreement indicating work was completed. If the property owner is unwilling to sign the Property Owner Agreement at that time, the property owner will be required to sign off at the end of the one-year warranty period.

3.2.9 Project Post-construction Meeting

Subcontractor shall attend a mandatory post-construction meeting, which will be scheduled after completion of field activities but prior to Subcontractor demobilization. The purpose of this final inspection/meeting is to close out any punchlist items, discuss schedule for demobilization, and status of all required deliverables.

3.2.10 Other Meetings

Additional meetings may occur in accordance with contract documents and as may be required by owner and contractor.

4. Document Control and Management

4.1 General

The Document Manager for the project is responsible for implementing the procedures in this section. A document control and management process will be implemented to ensure that current and correct documents are available where the work is performed and that project records are archived after the work has been completed. The Field Quality Manager is responsible for maintaining field files in accordance with the file structure. The Field Quality Manager is also responsible for providing backup of field files to the central project files as required by these procedures. The Site Manager will be responsible for ensuring that project personnel, subcontractors, lower-tier subcontractors, and customers use the correct version of project documents.

The project document management processes are summarized in the table below:

Document Manager:	TBD
Project Hard Copy Files Location:	CH2M HILL Milwaukee Office, 4th Floor (permanent central project files) CH2M HILL Field Office during construction
Project Electronic Files Location(s):	Internal Project File Location: \\Hercules\proj\EPA Externally Available Project File Location: TBD (Sharepoint or similar web-based server)
Document/Record Management Tool:	Microsoft Excel – Master Document List
Field Files Backup System:	Field Quality Manager will have a T1 line on the project and will send field files daily to the Document Manager for backup.
Project File Structure:	Attached (Appendix A.1 Form ES-P8-02)

4.2 Document Control Process

Documents and records are controlled by the Document Manager. The Field Quality Manager is responsible for implementing control of field documents and records. Obsolete copies will be appropriately marked and/or removed from the work site and destroyed.

- The Site Manager is responsible for ensuring that all project personnel, subcontractors, lower-tier subcontractors, and customers use the correct version of project documents.

The project document control processes are provided in SOP ES-P8-02, Document and Records Management (Appendix A.1).

4.3 Document Management Process

Documents and records are managed by the Document Manager. The Field Quality Manager is responsible for implementing management of field documents and records. Obsolete copies will be appropriately marked and/or removed from the work site and destroyed.

Project records will be identified, safeguarded, and retained to provide evidence of project activities and quality. Standard forms should be used for project documentation whenever possible. The document management process is provided in SOP ES-P8-02, Document and Records Management.

The Site Manager is responsible for ensuring that those records intended for permanent storage are so designated and forwarding material to be stored to delivery center archives. A copy of the archive list for each box of records sent to the offsite storage facility will be sent to the Document Manager. Records will be protected from deterioration or loss through storage in file cabinets or other secure locations.

4.4 Document Transmittals

Document transmittals between the project parties provide a record of communications, and are necessary for keeping appropriate construction and QA personnel informed of project requirements, progress, changes, and quality of the work. To prevent misunderstandings and omissions, transmittals should be formally communicated with proper documentation and confirmation of submittal and receipt.

4.4.1 Subcontract Clarification/Interpretation Requests

Subcontract Clarification/Interpretation Requests and Requests for Information (Appendix A.2, Form 270) are submitted when an explanation of the intent of specific project requirements, as presented in the Subcontract Documents, is required. These are generally submitted by the Subcontractor to the Construction Manager; however, the Construction Manager can submit clarification/interpretation requests to the Subcontractor.

Subcontract Clarification/Interpretation Requests shall be submitted to the CH2M HILL Design Team through the Construction Manager. All interpretations of design or specifications by the Design Team will be issued in writing. In special cases, a design engineer may communicate a design interpretation or clarification verbally, followed by written confirmation. Responses to Subcontract Clarification/Interpretation Requests will be obtained in a timely manner to limit the impact on the project schedule. The Construction Manager is responsible for informing all parties of the Design Team's interpretations, and will control the distribution of documents to construction, QA, and regulatory personnel.

4.4.2 Subcontract Modification Requests

A Subcontract Modification Request is made if a change to the contract documents is deemed necessary for the following reasons:

- Changed site conditions

- Changed materials conditions
- Alternative design procedures proposed
- Alternative materials proposed

Subcontract Modification Requests or Change Orders (Appendix A.3, Form 273) are generally prepared in response to a Subcontract Clarification/Interpretation Request submitted by the subcontractor or the Construction Manager. Subcontract Modification Requests should be submitted to the Construction Manager for coordination with the appropriate groups. The Construction Manager will review, negotiate, and finalize all Subcontract Modification Requests and forward modifications to the Site Manager for approval. The Construction Manager will issue subcontract modifications (change orders) as necessary. Responses to Subcontract Modification Requests will be obtained in a timely manner to limit the impact on the construction schedule. The Construction Manager is responsible for transmitting all Subcontract Modifications to the appropriate organizations, before the change becomes part of the project record.

Likewise, the Construction Manager may issue a Field Order (Appendix A.4, Form 275) for clarification and interpretation of drawings in cases where a subcontract modification is not suitable. For example, a Field Order may be issued in response to a subcontractor-initiated Subcontract Clarification/Interpretation Request when the clarification does not affect the design intent, schedule or cost of the work.

4.4.3 Submittals

Field Testing and QC Submittals

Submittals are administrative and technical documents such as design drawings, shop drawings, work plans, permits, certifications, schedules, reports, and other types of documents and any accompanying samples that are required for the work.

Construction QC submittals are those generated by the Field Quality Manager or by the subcontractor prior to or during construction to demonstrate compliance with the project plans, specifications, and drawings. For materials/equipment procured directly by the contractor, the Field Quality Manager is responsible for ensuring the proper submittals are provided by the suppliers before accepting delivery. For materials and equipment supplied by the subcontractor, the Field Quality Manager is responsible for ensuring the proper submittals are provided and approved prior to delivery or installation.

The Subcontract Documents require that the subcontractor submit a Contractor Quality Control (CQC) Plan, materials certifications, inspection and test data, etc., for review by the Construction Manager and staff. Documents shall be submitted to the Construction Manager, who will forward copies to the Site Manager for conformance evaluation and incorporation into the records. Lower-tier subcontractor and vendor submittals shall be made through the subcontractor. All test data and similar submittals shall be submitted with a transmittal form (Appendix A.5, Form 295) outlining the contents of the submittal and the date submitted.

Technical Submittals

The subcontract documents require that the subcontractor submit various submittals, as listed in Table 1. Documents shall be submitted using the Transmittal of Subcontractor's Submittal form (Appendix A.5, Form 295) to the Site Manager according to the frequency and number specified in the subcontract documents. Electronic submittals may be used as appropriate for concurrent submittal to the Site Manager and Construction Manager. Lower-tier subcontractor and vendor submittals shall be made through the subcontractor.

As submittals are received, the Site Manager will document their receipt on the Routing of Subcontractor's Submittal. The Site Manager will assign the submittal to appropriate project team members for detailed review (Appendix A.6, Form 296). Reviewers will check the submittal for general compliance with the contract documents and will note missing information or deviations on the Submittal Review Comments form (Appendix A.7, Form 299SR). The Construction Manager will oversee the review process and help resolve questions regarding compliance with subcontract documents.

Review comments on submittals will clearly state information the reviewer considers to be lacking. Notes will be written legibly with red ink on the front sheet of a submittal so that deficiencies can be clearly identified by the subcontractor. Notes will not be in the form of questions; rather, they will state what has been omitted or what is unacceptable.

Following the detailed review, the Site Manager will send a marked copy of the submittal and a submittal reply form to the subcontractor. The Site Manager will indicate on the submittal reply form whether deviations from the subcontract documents were noted, and whether additional submittals or resubmittals by the subcontractor are required. The Site Manager will keep the Construction Manager informed of the submittal process. Copies of the original submittal, review copies, and submittal log and reply forms will be kept in a project submittal file.

Stakeholder Approval

If a submittal requires stakeholder or property owner approval, it should be indicated clearly in the Preconstruction Meeting records, on the drawings, and on the submittal register. Submittals for items that are an extension of the work and may impact the progress of the work will need to be scheduled and processed in advance. These submittals still require review for conformance and certification by the Field Quality Manager.

TABLE 1
Submittal Summary
South Minneapolis Residential Soil Contamination Site

Submittal		Specification Reference	Due Date
1	Certificate of Insurance	Sec. 01 11 00 1.04 A 1	Prior to subcontract award
2	Completed Certification of Compliant Drug Policy	Sec. 01 11 00 1.04 B 1	Prior to subcontract award
3	Subcontractor's Site-Specific Health and Safety Plan	Sec. 01 11 00 1.04 B 2	Prior to subcontract award
4	Subcontractor's Activity Hazard Analysis (AHA) Worksheets	Sec. 01 11 00 1.04 B 2	Prior to subcontract award
5	Proof of Training and Medical Monitoring Programs	Sec. 01 11 00 1.04 B 3	Prior to subcontract award
6	Material Safety Data Sheets	Sec. 01 11 00 1.04 B 4	Prior to subcontract award
7	Copies of Subcontractor's Business Licenses	Sec. 01 11 00 1.04 B 5	Prior to subcontract award
8	Current Hazardous Waste Site Training and Medical Surveillance Documentation for All Field Personnel	Sec. 01 11 00 1.05 A 1	2 weeks after subcontract award and 1 week prior to mobilization
9	Project Schedule and Schedule Narrative	Sec. 01 11 00 1.05 A 2	2 weeks after subcontract award and 1 week prior to mobilization
10	Contractor Quality Control Plan	Sec. 01 11 00 1.05 A 3	2 weeks after subcontract award and 1 week prior to mobilization
11	Work Plan	Sec. 01 11 00 1.05 A 4	2 weeks after subcontract award and 1 week prior to mobilization
12	Storm Water Management Plan	Sec. 01 11 00 1.05 A 5	2 weeks after subcontract award and 1 week prior to mobilization
13	Waste Management Plan	Sec. 01 11 00 1.05 A 6	2 weeks after subcontract award and 1 week prior to mobilization
14	Daily Reports	Sec. 01 11 00 1.05 B 1	Daily
15	Remedial Action Completion Form	Sec. 01 11 00 1.05 B 2	Upon completion at each property
16	Schedule of Values	Sec. 01 11 00 1.05 B 3 and Sec. 01 29 00 1.01 A 1	Weekly
17	Progress Schedule and Narrative Report	Sec. 01 11 00 1.05 B 4	Once per month unless otherwise noted

TABLE 1
Submittal Summary
South Minneapolis Residential Soil Contamination Site

Submittal		Specification Reference	Due Date
18	As-built Redline Drawings	Sec. 01 11 00 1.05 B 5	At substantial completion of each construction season for all completed properties
19	Quantities of Waste Generated	Sec. 01 11 00 1.05 B 6	Daily
20	Schedule of Estimated Progress Payments	Sec. 01 29 00 1.01 A 2	2 weeks after subcontract award and 1 week prior to mobilization
21	Application for Payment	Sec. 01 29 00 1.01 A 3	Monthly
22	Final Application for Payment	Sec. 01 29 00 1.01 A 4	Once at completion of project
23	Weight or Load Tickets for Materials Paid for by Weight	Sec. 01 29 00 1.05 A	Within 1 day of weighing
24	Job Hazard Analysis or Activity Hazard Analysis	Sec. 01 31 13 1.01 A 1 and 31 10 00 1.02 B	Prior to mobilization and reviewed before starting work at each property
25	Completed Utility Locate Tickets	Sec. 01 31 13 1.01 A 2	Within 2 days prior to excavation activities
26	Property Sketch Showing Existing Conditions	Sec. 01 31 13 1.01 B 1	Within 3 days after Residential Preconstruction Meeting
27	Property Sketch Showing Restoration and Replacement Plan	Sec. 01 31 13 1.01 B 2	Within 3 days after Residential Preconstruction Meeting
28	Survey Documentation	Sec. 01 31 13 1.01 B 3	Submit upon completion of work for each property
29	Preliminary Progress Schedule	Sec. 01 32 00 1.01 A 1	Submitted with subcontractor's proposal
30	Detailed Progress Schedule	Sec. 01 32 00 1.01 A 2	At least 5 days prior to Preconstruction Conference
31	Updated Progress Schedule	Sec. 01 32 00 1.01 A 2b	Every 2 weeks
32	Subcontractor Certification of Schedule	Sec. 01 32 00 1.01 A 3	With each Updated Progress Schedule
33	Narrative Progress Report	Sec. 01 32 00 1.01 A 3	With each Updated Progress Schedule
34	Progress Quantity Chart	Sec. 01 32 00 1.01 A 3	With each Updated Progress Schedule
35	Final Updated Progress Schedule	Sec. 01 32 00 1.01 A 4	Prior to final payment

TABLE 1
Submittal Summary
South Minneapolis Residential Soil Contamination Site

Submittal		Specification Reference	Due Date
36	Contractor Quality Control (CQC) Report Format	Sec. 01 45 16.13 1.03 A 1	Not later than 30 days after receipt of Notice to Proceed
37	CQC Plan	Sec. 01 45 16.13 1.03 A 2	Not later than 30 days after receipt of Notice to Proceed
38	CQC Report	Sec. 01 45 16.13 1.03 A 3	Daily within 24 hours of work
39	Copies of Permits and Approvals Required for Construction	Sec. 01 50 00 1.01 A 1	Prior to mobilization and as required during construction
40	Subcontractor's and Contractor's Field Office and Staging Area Plans	Sec. 01 50 00 1.01 A 2a	2 weeks after subcontract award and 1 week prior to mobilization
41	Fencing and Protective Barrier Locations and Details	Sec. 01 50 00 1.01 A 2b	2 weeks after subcontract award and 1 week prior to mobilization
42	Stormwater Management Plan	Sec. 01 50 00 1.01 A 3a	2 weeks after subcontract award and 1 week prior to mobilization
43	Environmental Control Plan	Sec. 01 50 00 1.01 A 3b	2 weeks after subcontract award and 1 week prior to mobilization
44	Transportation Plan	Sec. 01 50 00 1.01 A 3c	2 weeks after subcontract award and 1 week prior to mobilization
45	Traffic Control and Routing Plans	Sec. 01 50 00 1.01 A 3d	2 weeks after subcontract award and 1 week prior to mobilization
46	Excavation Water Submittals	Sec. 01 50 00 1.01 A 4	As required during construction
47	Record Documents	Sec. 01 77 00 1.01 A 1a	Prior to submission of Final Application for Payment
48	Special Bonds, Guarantees, and Service Agreements	Sec. 01 77 00 1.01 A 1b	Prior to submission of Final Application for Payment
49	Consent of Surety to Final Payment	Sec. 01 77 00 1.01 A 1c	Prior to submission of Final Application for Payment

TABLE 1
Submittal Summary
South Minneapolis Residential Soil Contamination Site

Submittal		Specification Reference	Due Date
50	Releases or Waivers of Liens and Claims	Sec. 01 77 00 1.01 A 1d	Prior to submission of Final Application for Payment
51	Releases from Agreements	Sec. 01 77 00 1.01 A 1e	Prior to submission of Final Application for Payment
52	Final Invoice for Payment	Sec. 01 77 00 1.01 A 1f	Prior to submission of Final Application for Payment
53	Clearing and Grubbing Limit Drawings	Sec 31 10 00 1.02 A	Within 3 days of residential preconstruction meeting
54	Excavation Plan	Sec. 31 23 16 1.02 A	Within 3 days of residential preconstruction meeting
55	Copies of Haul Tickets	Sec. 31 23 16 3.06 C	Daily
56	Borrow Source for Contractor Sampling and Approval	Sec. 31 23 23 1.03 A 1	2 weeks after subcontract award and 1 week prior to mobilization
57	Subcontractor Compaction Test Results	Sec. 31 23 23 1.03 A 2	Within 24 hours of testing
58	Manufacturer’s Data Sheets for Compaction	Sec. 31 23 23 1.03 B	2 weeks after subcontract award and 1 week prior to mobilization
59	Copies of Permits and Approvals for Construction	Sec. 32 10 01 1.01 A 1	As required during construction
60	Samples of Proposed Restoration Materials	Sec. 32 10 01 1.01 A 2	Prior to installation
61	Results of Inspection or Testing Existing Systems	Sec. 32 10 01 1.01 A 3	Within 24 hours of testing
62	Manufacturer's Instructions/Data Sheets for Replacement Materials	Sec. 32 10 01 1.01 B	Prior to installation
63	Shop Drawings with Construction Details	Sec. 32 31 13 1.04 A 1	Prior to installation
64	Samples of Fencing Materials	Sec. 32 31 13 1.04 A 2	Prior to installation
65	Manufacturer's Instructions	Sec. 32 31 13 1.04 B 1	Prior to installation
66	Supplier / Installer Qualifications	Sec. 32 31 13 1.04 B 2	Prior to installation
67	Special Guarantee	Sec. 32 31 13 1.08 A	2 weeks after installation

TABLE 1
Submittal Summary
South Minneapolis Residential Soil Contamination Site

Submittal		Specification Reference	Due Date
68	Borrow Source for Contractor Sampling and Approval	Sec. 32 91 13 1.03 A 1	2 weeks after subcontract award and 1 week prior to mobilization
69	Subcontractor Compaction Test Results	Sec. 32 91 13 1.03 A 2	Within 24 hours of testing
70	Certified Topsoil Analysis Reports	Sec. 32 91 13 1.03 B 1	Prior to installation
71	Compost Certification	Sec. 32 91 13 1.03 B 2	2 weeks after subcontract award and 1 week prior to mobilization
72	Product Labels and Data Sheets	Sec. 32 92 00 1.04 A	Prior to installation
73	Certification of Seed, Source and Seed Mix	Sec. 32 92 00 1.04 B 1	Prior to installation
74	Certification of Sod	Sec. 32 92 00 1.04 B 2	Prior to installation
75	Required Maintenance Activities/Frequency	Sec. 32 92 00 1.04 B 3	Weekly
76	Watering Plan and Schedule	Sec. 32 92 00 1.04 B 4	Weekly
77	Standard and Organic Fertilizer Products	Sec. 32 92 00 1.04 B 5	Prior to installation
78	Erosion Control Blanket Product Information and Sample	Sec. 32 92 00 1.04 B 6	Prior to installation
79	Plant Material Source List	Sec. 32 93 00 1.03 A 1	Prior to installation
80	Product Data on Manufactured Products Specified	Sec. 32 93 00 1.03 A 2	Prior to installation
81	Shrub and Tree Instructions for Storage, Planting, Fertilizing, Care and Maintenance	Sec. 32 93 00 1.03 B 1	Prior to installation
82	Nursery Guarantee or Warranty	Sec. 32 93 00 1.03 B 2	Prior to installation

4.4.4 Nonconformance Reports

Initiation of Reports

When materials, methods, or work elements are not in accordance with Subcontract Documents and immediate resolution cannot be achieved, a nonconformance report (Appendix A.8, Form 442) will be prepared. Nonconformance reports initiated by field inspectors will be submitted to the Construction Manager, who will issue the nonconformance report to the subcontractor and see that the subcontractor develops a corrective action plan.

The written nonconformance report should be issued as soon as possible after nonconformance is detected. Each nonconformance report will be assigned a unique file number and recorded on a nonconformance report log (Appendix A.9, Form 444). The log will allow the status of the nonconformance to be easily tracked.

The sole exception to this policy will be verbal notices made by the Construction Manager to the subcontractor for procedures that can be, and are, corrected immediately upon notice. Verbal notices will be recorded in the daily reports with an explanation of corrective measures taken and the time required to bring the work into conformance.

4.4.5 Resolution of Nonconformances

No payment will be issued for nonconforming work until associated nonconformances are resolved. Each nonconformance report will remain in effect until corrective actions have been taken that meet the intent of the subcontract documents and the satisfaction of onsite QA representatives. When corrective actions are acceptable, the Construction Manager will document the corrective actions taken and results of any retests, and will complete the acceptance portion of the nonconformance report. Likewise, the Construction Manager will observe and document the corrective actions and acceptability of the results on field observation forms. Whenever possible, retests should be performed by the same Construction Manager who initially detected the nonconformance.

Full documentation is required for resolution of each nonconformance report. When a nonconformance is resolved, the following documentation procedures (Appendix A.10, Form 443) will be followed:

- A copy of the observer's explanation of corrective action and acceptance will be attached to the nonconformance report for review and filing.
- Daily reports, data summaries, etc., will be updated to reflect the resolved status of the original deficiency (e.g., notes of corrective action in observation reports, resubmittals, retest results). At a minimum, the nonconformance report file number, date, test number, etc., that identify the initial deficiency will be included.
- The corrected nonconformances will be checked off the record book, initialed, and dated by the Construction Manager, subcontractor, or designated representative.

5. Quality Requirements

5.1 General

The quality of materials and workmanship will be controlled by the subcontractor or supplier who furnishes the work or material involved; however, the subcontractor has the ultimate responsibility for QC of its sub-subcontractors and vendors.

QA personnel (i.e., Construction Manager's staff and outside laboratories or consultants designated by the Construction Manager) will observe QC testing of the construction materials, workmanship, and the Subcontractor's QC activities. Specific QA requirements for observation and verification testing are detailed in the appendixes. Appendix A contains samples of forms that may be used or modified to document QA activities.

QC testing, sampling, and inspecting will be conducted by the subcontractor, the subcontractor's supplier, or subcontracted independent testing companies. The subcontractor shall provide to the Construction Manager, in a timely fashion or as specified, copies of QC inspection and testing reports if specified in the subcontract. These reports will include documentation of failed tests and corrective actions taken.

5.2 Observation and Verification Testing

Appendix B outlines the required QA observations and verification testing. The field personnel should obtain, review, and familiarize themselves with the applicable procedures, codes, standards, specifications, drawings, observation and verification testing requirements and criteria.

The Construction Manager oversees the proper performance of the required QA observation. To accomplish this, random observation and verification testing may be conducted.

The Construction Manager or other designated personnel will document observations in the Testing Plan Log (Appendix A.11, SOP ES-P6-05) and Daily Report (Appendix A.12 SOP CQMM-017) and will document verification tests in the appropriate testing forms. All documentation will be recorded in ink. To correct an error in an inspection report, a single line will be drawn through the error with the correct information entered next to the error. All corrections will be initialed and dated.

Daily observation records and verification testing forms will contain at least the following information:

- Item, condition, or activity observed or testing performed
- Location of observation or verification test
- Date of the observation or verification test
- Construction Manager's name and signature
- Type of observation or verification test

- Observation or verification test source criteria (e.g., drawing, specification)
- Results or acceptability
- Reference to corrective action taken in connection with nonconformance
- Relevant nonconformance report number

5.3 Quality Assurance Subcontracts

The QA subcontracts include contracts for independent laboratory testing.

Items or services procured for QA purposes that may affect the measurement of the quality of the construction project should meet the requirements of the contract specifications and this PQMP, as applicable.

6. Inspection

6.1 General

An inspection is necessary for acceptance of all definable feature of work. The project team needs to define the critical inspection tasks during the planning phase of the project. The project cannot begin field activities until the critical inspection tasks are listed on the Critical Inspection Log (Appendix A.13, SOP ES-P6-12). A critical inspection provides the basis for accepting a definable feature of work and its suitability to perform the purpose intended. The critical inspection involves the observation, measurement and possibly testing of the work at its point of installation to assure compliance with project requirements. A punch list inspection includes work that is not critical; however, is required for successful completion of the Work prior to final USEPA and property owner acceptance.

The Project Quality Manager will be responsible for assuring the SOP ES-P6-12, is followed.

The Field Quality Manager will be responsible for directing field inspectors in accordance with SOP ES-P6-12. The Field Quality Manager is responsible for documenting (written and photographic) the inspections in the Critical Inspection Log and ensuring documentation in the Daily Report. Field Quality Manager is responsible for maintaining the punch list during the progress of the work.

6.2 Inspection Punch List

Punch list items should be addressed during the course of the work and the punch list inspection will occur near the completion of work for each property. The Field Quality Manager will inspect the work and develop a punch list of items that do not conform to the approved drawings and specifications. The punch list will include remaining items on the rework items list that were not corrected before the punch list inspection. The punch list will include the estimated date by which the deficiencies will be corrected. The Field Quality Manager will make follow-on inspections to ascertain whether deficiencies have been corrected. Once this is accomplished, the contractor will notify the owner that the feature of work is ready for prefinal inspection.

6.3 Residential Post-construction Meetings: Final Acceptance Inspection

A prefinal inspection—a residential post-construction meeting—will be performed with the property owner to verify that the work is complete and meets contract specifications and drawings. The Field Quality Manager, Construction Manager, Earthwork Subcontractor, Landscaping Subcontractor, and property owner will attend the residential post-construction meeting/inspection. A prefinal punch list will be developed as needed as a result of this inspection. Each deficiency noted in the punch list will be referenced (applicable

specification paragraph, drawing, etc.). Items noted during the prefinal inspection will be corrected within the time slated for completion of the entire work, or any particular increment thereof if the project is divided into increments by separate completion dates. The Field Quality Manager will ensure that items on the list are corrected before notifying stakeholders that a final inspection can be scheduled.

A final inspection will be performed in a second meeting with the property owner after the residential post-construction meeting and completion of punch list items for that property. Final inspections will be scheduled on predetermined days each month with the Contractor, USEPA representative, and property owner in attendance. At the conclusion of the final inspection, the property owner will be asked to sign the Property Owner Agreement indicating work was completed. If the property owner is unwilling to sign the Property Owner Agreement at that time, the property owner will be required to sign off at the end of the one-year warranty period. This will be documented in a final inspection report to be developed. The property owner will also be asked to participate in completing a Residential Property Satisfaction Checklist to be developed.

7. Quality Documentation

7.1 General

All project quality activities and submittals pertaining to the contract and subcontract documents and the PQMP will be documented.

7.1.1 Photographic Record

A project photographic record will be made and kept as part of the quality records. In addition to recording construction progress and "as-constructed" installation details, the photographic record will document deviations from design and nonconformance items. Each photograph will be marked with a sequence number, date, location, photographer, and description. Digital cameras will be used by the project team and photos electronically logged and filed for record purposes. The Field Quality Manager will maintain the photographic record file (Appendix A.14, Form 303).

7.1.2 Field Documentation

The object of field documentation is to ensure that appropriate project information is documented in logbooks during construction. Documentation is important for communicating with other staff members and other project representative. The following regular QC observations, inspections, and records of general QC activities should be made:

- Record daily progress and associated QA and QC sampling
- Record construction operations, sequence, staging, etc.
- Maintain waste disposal records (Appendix A.15, ES-P6-01)
- Describe deviations from expected conditions, or unexpected problems and their resolution

The Field Quality Manager will maintain a record of daily QC activities during construction in a field logbook. The logbook will be available upon request for review. It will be used to record at least the following information:

- Date of entry
- Project name and location
- Time that work starts every day
- Summary of weather conditions
- General description of work , size of work crew, and equipment and personnel onsite
- Duration and type of breaks
- Start time and duration of downtime resulting from equipment breakdown, weather, or emergencies
- Summaries of QC meetings and actions recommended to be performed
- Conversations with subcontractors, property owners, or residents
- QC testing equipment and personnel
- Identification of work locations

- Description of materials delivered to the site, including QC data
- Decisions made regarding defective work or corrective measures implemented, or both
- Field tests
- Sampling activities

The bottom of each page of the field log book shall be signed or initialed and each entry dated to show that notes are being entered daily.

A line-out will be placed on any part of an unused page. One-line strike-through will be used to show corrections to entries. The strike-through will be initialed and dated. No correction fluid may be used.

The field documentation will also be documented in the daily report.

7.2 Daily Report

The daily report is the daily record of operations on the job site and will be kept current (Appendix A.12, CQMM-017). It is an essential tool for recording and reporting the daily production safety, and quality activities of the project. These reports are the official record of work performance and compliance with project plans, drawings, and specifications. It is therefore important that the reports are correct and timely.

The Field Quality Manager is responsible for preparing the daily report and submitting the reports to the Project Manager and Project Quality Manager for review. The Project Manager is responsible for submitting the daily report to the Remediation Manager. The Site/Construction Manager will provide operational information and the Health and Safety Coordinator will provide information on the health and safety activities for the daily report. The report also includes reports from each subcontractor working on the site to address, at a minimum, the following:

- Quality aspects of the project that is being performed by the subcontractor
- Scheduling and resource issues
- Site safety inspections and concerns
- Environmental concerns
- Job progress
- Control inspections
- Tests performed and their results
- Personnel and equipment onsite
- Material received

The project team will review the daily reports for accuracy and completeness because these reports are used to prepare the final reports for the project. The Project Manager will review the reports and ensure the quality process is working on the project. The Project Quality Manager will review the reports to ensure the quality processes and systems are working on the program.

Appendix A
Forms

Appendix A.1

Documents and Records Management (SOP ES-P8-02)

1.0 PURPOSE

The purpose of this process is to manage documents and records generated throughout the life of the project. For each project, a document and records management process must be implemented. This process is to ensure that current and correct documents and records are available where the work is performed and available to all members of the project team. The process also ensures that project records are accessible after the work has been completed. This SOP covers these procedures.

2.0 SCOPE

The document and records management process provides for the following:

- Establish file system and directions to project staff for documents to file
- Maintain project files to enable timely access to documents and records
- Provide for retention and archival
- Provides an example file structure
- Provides an example document list template
- Provides an example electronic project file structure

3.0 SPECIFIC REQUIREMENTS

The Project Manager will assign a Document Manager (DM) at the beginning of the project. The DM may also perform the functions of another role on the project team. The DM serves as the person primarily responsible for managing project documents and records. The DM reports to the PM and obtains support from the Project Quality Manager and other administrative support. The DM functions as a member of the project team throughout the life of the project.

The Project Manager, along with the DM, decides the location at which project documents and records (hardcopy and electronic) will reside. The DM will then be responsible for coordinating document submittals, records management, and tracking. At project closure, the DM, in conjunction with the Project Quality Manager and PM, will be responsible for archiving hardcopy and electronic versions of the project documents and records.

The DM's responsibilities include the following:

- Tracking document status in the Master Document List through software programs such as Excel or Access, or through a project management software program such as Primavera Expedition;
- Training the project team on the file structure and populating the files
- Ensuring essential documents are placed in the project files
- Uploading documents into a central electronic locations determined with the Project Manager
- Archiving documents and records

Project records provide objective evidence of operational, quality, health and safety, and regulatory-related activities. Project records must be identified, safeguarded, and retained to provide evidence of project activities and quality. Standard forms are used for project documentation whenever possible.

Procedures are established for record identification, classification, storage, retrieval, and disposition. The Project Filing System Template, included in Tab B, should be followed for the electronic filing system, hard copy project filing system, and site filing system.

The Project Manager is responsible for ensuring that those records intended for permanent storage are so designated and for forwarding material to be stored to project archives. A copy of the archive list for each box of records sent to the offsite storage facility must be sent to the DM, if not prepared by the DM. Records must be protected from deterioration or loss through storage in file cabinets or other secure locations.

4.0 FLOWCHART

Attached in Tab A

5.0 PROCESS

1. Upon receipt of a proposal, a DM must be assigned in order to gather information from project inception. The DM may be an administrative assistant or a member of the project team. However, it may not be the PM. The DM is assigned to perform the tasks described herein throughout the life of the project. If the DM responsibilities must be reassigned, adequate time must be allowed for the outgoing DM to train and transition with the incoming DM.
2. Prior to project kickoff and team chartering, the DM, PM, and Project Quality Manager shall determine the hardcopy file location. They will also determine which files on the Project Filing System Template will be set up for the project.
3. Prior to project kickoff and team chartering, the DM, PM, and Project Quality Manager shall determine the electronic file location(s). The DM shall set up the electronic filing system in the same way as the hardcopy filing system. For documents and records that need to be accessible to members of the project team outside of CH2M HILL, SharePoint may be used. However, an internal project file must be set up so that confidential files can be stored.
4. Prior to project kickoff and team chartering, the DM, PM, and Project Quality Manager shall determine the tracking system to be used for the project. For large projects, Expedition may be used. For other projects, the Master Document List (see Tab C), in Microsoft Excel should be used to track project documents and records.
5. During the project kickoff and team chartering, the DM will describe and explain the Documents and Records Management process that will be used for the project. It is essential that all documents and records, whether submitted or not to the client, are sent to the DM for inclusion into the project files (electronically and hardcopy) and tracked.
6. Throughout the life of the project (proposal through archiving), the DM must collect, store, and track documents and records such that they are accessible and retrievable. It is the PM's and Project Quality Manager's responsibility to ensure that the project files are

complete and that duplicated and irrelevant material are purged periodically prior to archiving.

7. It is every project team member's responsibility to provide accurate, complete, and relevant documents and records to the DM for inclusion into the project files.
8. Only final versions of documents should be stored in the project files. Working versions may be stored in a location designated by the DM.
9. For documents and records requiring review and approval during field activities, the Field Quality Manager will track those through a Project Submittal Register (SOP CQMM-019).
10. Project documents and records must not be stored in a project team member's computer hard drive only. Within 1 week of finalization, the document or record must be submitted to the DM for inclusion in the project files.
11. It is the DM's responsibility to track the location of each document or record until deletion or destruction of that document or record.
12. At project close-out, the DM shall archive both electronic and hardcopy files as described in the corporate archiving procedures and policies. The completed Master Document List shall be included in both the electronic and hardcopy archives.

6.0 TOOLS AND SOFTWARE

Excel, Expedition, SharePoint

7.0 FORMS AND EXHIBITS

Tab A – Flow Chart

Tab B – Project Filing System Template

Tab C – Master Document List

8.0 REFERENCES

ES Construction Quality Management Manual

CH2M HILL Records Retention Policy

CH2M HILL E-mail Retention Policy

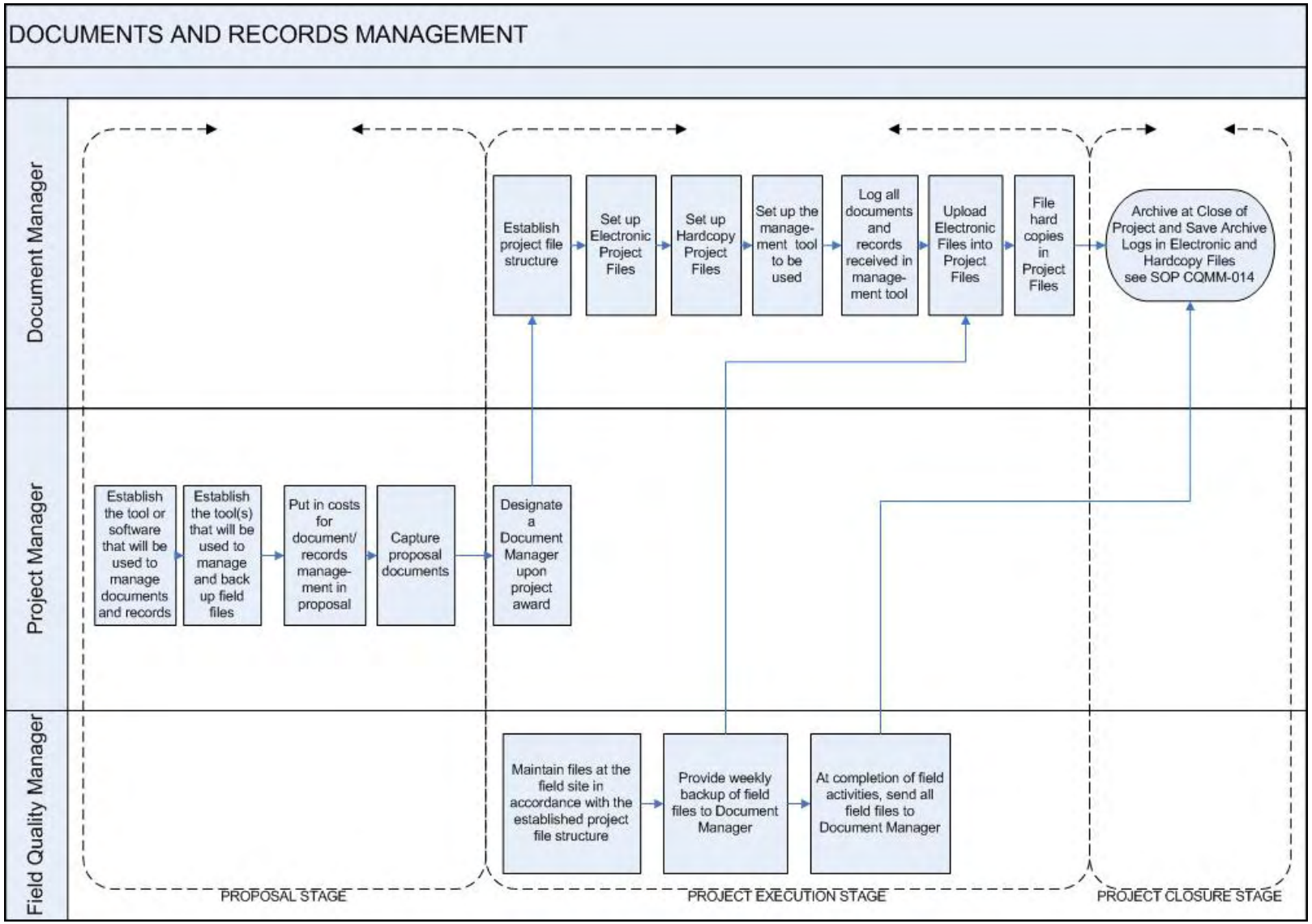
CH2M HILL Archiving Procedures and Policies

Submittal Review and Control, SOP CQMM-018

Project Kickoff and Team Chartering, SOP CQMM-019

Approved For Use By

Title	*Signature*	*Date*
Construction Quality Manager		
Title	*Signature*	*Date*


DOCUMENTS AND RECORDS MANAGEMENT
Document Manager
Project Manager
Field Quality Manager
Establish project file structure
Set up Electronic Project Files
Set up Hardcopy Project Files
Set up the manage-ment tool to be used
Log all documents and records received in manage-ment tool
Upload Electronic Files into Project Files
File hard copies in Project Files
Archive at Close of Project and Save Archive Logs in Electronic and Hardcopy Files see SOP CQMM-014
Establish the tool or software that will be used to manage documents and records
Establish the tool(s) that will be used to manage and back up field files
Put in costs for document/ records manage-ment in proposal
Capture proposal documents
Designate a Document Manager upon project award
Maintain files at the field site in accordance with the established project file structure
Provide weekly backup of field files to Document Manager
At completion of field activities, send all field files to Document Manager
PROPOSAL STAGE
PROJECT EXECUTION STAGE
PROJECT CLOSURE STAGE

APPENDIX B

Number	Title	Check Which Will Be Required by The Project
1.0	**Administrative**	X
1.01	Contract and Modifications	X
1.02	Cost Proposal	
1.03	Performance Evaluation	X
1.04	Correspondence	X
1.04.01	Incoming Correspondence	X
1.04.02	Outgoing Correspondence	X
1.04.03	Memoranda	
1.04.04	E-mails	X
1.05	Change Management	X
1.05.01	Request For Information/Clarification and RFI Log	X
1.05.02	Change Orders and Log	X
1.06	Monthly Status Reports	X
1.07	Financials	X
1.08	Certified Payroll Records	
1.09	Controls and Scheduling	X
1.09.01	Baseline Schedule	X
1.09.02	Schedule of Values	X
1.09.03	Progress Schedule Update and Narrative Report Package	X
1.09.04	Three Week Look Ahead	X
1.10	Claims Records and Logs	X
1.11	Releases - Waivers of Liens	X
1.12	Project Substantial Completion	X
1.13	Project Reviews	X
1.14	Miscellaneous	
2.0	**Meetings**	**X**
2.01	Meeting Minutes	X
2.02	Project Kickoff, Instructions and Chartering	X
2.03	ORR (Operational Readiness Review)	
2.04	Pre-Construction Conference	X
2.05	Coordination and Mutual Understanding	X
2.06	Weekly Project Status and Planning	X
2.07	Post-Operations / Lessons-Learned	X
3.0	**Subcontracts**	X
3.01	Project Office	
3.01.01	Office Lease	
3.01.02	Office Furnishings	
3.01.03	Office Supplies	
3.01.04	Fed Ex Account Information	X
3.01.05	Bottled Water Service	
3.01.06	Cleaning Service	
3.01.07	Porta Potty Service	
3.02	Subcontractor 1	X
3.02.01	Subcontracts and Scopes of Work	X
3.02.02	Subcontractor Proposals and Evaluations	X
3.02.03	Certifications and Licenses	X
3.02.04	Insurance and Bonds	X
3.02.05	Subcontractor Plans	X
3.02.05.01	Health and Safety and AHAs/JHAs	X
3.02.06	E-mails	X
3.02.07	Invoices and Schedule of Values	X
3.02.08	Miscellaneous	X
3.03	Subcontractor 2	X
3.03.01	Subcontracts and Scopes of Work	X
3.03.02	Subcontractor Proposals and Evaluations	X
3.03.03	Certifications and Licenses	X
3.03.04	Insurance and Bonds	X
3.03.05	Subcontractor Plans	X
3.03.05.01	Health and Safety and AHAs/JHAs	X
3.03.06	E-mails	X
3.03.07	Invoices and Schedule of Values	X
3.03.08	Miscellaneous	X
4.0	**Technical / Project Plans**	X
4.01	Technical Memoranda and Correspondence	X
4.02	Design Documents	X
4.03	Design Changes	X
4.04	Work Planning	X
4.04.01	Emergency Contact Information	X
4.04.02	Emergency Response Plan	X
4.04.03	Project Organization Chart	X
4.04.04	Procedures	X
4.04.05	Codes and Standards	X
4.04.06	Traffic Control	X
4.05	Work Plan	X
4.06	Health and Safety Plan	X
4.07	Sampling and Analysis Plan	X
4.08	Quality Control Plan	X
4.09	Waste Management Plan	X
4.10	Right of Way Easements	X
4.11	Access Agreements	X
4.12	Maps/Figures	X

4.13	Miscellaneous	X
5.0	**Project Records**	X
5.01	Daily Reports	X
5.02	Subcontractors Daily Reports	X
5.03	Weekly Reports	X
5.04	Inspection Reports	X
5.04.01	DFOW Inspections	X
5.04.02	Pre-Final Inspection	X
5.04.03	Punch List	X
5.04.04	Final Inspection	X
5.05	Submittals and Submittal Register	X
5.05.01	Guarantees / Warranties	X
5.05.02	O&M Manuals	X
5.05.03	Shop Drawings	X
5.05.04	Material Certificates	X
5.05.05	Catalog Pages / Cut Sheets	X
5.05.06	Owner-Furnished Equipment Documentation	X
5.05.07	Performance and Functional Acceptance Test Reports	X
5.05.08	Concrete Batch Tickets	
5.05.09	Backfill Tickets	X
5.05.10	Equipment and Spare Parts List	X
5.05.11	Start-Up Records	
5.06	Calibrations	
5.07	Data Review and Validation Reports	X
5.08	Sampling Records	X
5.09	Testing and Testing Plan and Log	X
5.09.01	Analytical	X
5.09.02	Physical	X
5.10	Transportation and Disposal	X
5.10.01	Waste Profiles, Manifests, Land Disposal Restriction Forms, Certificates of Disposal/Destruction/Recycling	X
5.10.02	Waste Tracking Logs	X
5.11	As-Built Drawings	X
5.12	Photos and Photo Log	X
5.13	Surveys	X
5.14	Site Personnel and Visitors Log	X
5.15	Field Notebooks	X
5.16	Rework Items List	X
5.17	Miscellaneous	X
6.0	**Health and Safety**	X
6.01	Tailgate Safety Meeting	X
6.02	AHAs/JHAs	X
6.03	OSHA Medical/Training Certifications	X
6.04	Inspections / Self Assessments / Work Observations	X
6.05	Audits	X
6.06	Incident Reports	X
6.07	MSDS	X
6.08	Air Monitoring and Calibrations	X
6.09	Miscellaneous	X
7.0	**Quality**	X
7.01	Nonconformances / Corrective Actions	X
7.02	Incident Reports	X
7.03	Audits	X
7.04	Miscellaneous	X
8.0	**Regulatory**	X
8.01	Permits	X
8.02	Air Pollution Control	X
8.03	Noise Control	X
8.04	Water Pollution Control	X
8.05	Erosion/Sediment and Flood Control	X
8.06	Audits	X
8.07	Incident Reports	X
8.08	Miscellaneous	X
9.0	**Reports**	X
9.01	Source Removal Reports	
9.02	Completion Reports	X
9.03	Quarterly Monitoring Reports	X
9.04	Construction Completion Report / Final Report	X
9.05	O&M Status Reports	
9.06	Miscellaneous	X
10.0	**Close-Out**	X
10.01	Close-out Checklist	X
10.02	Contract Closeout	X
10.03	Master Document List	X
10.04	Archive	X
10.05	Miscellaneous	X

MASTER DOCUMENT LIST

Item No	Document / Record Name, Description, Version	Transmittal Number	Transmittal Date	Transmitted By	Transmitted To	Electronic File Location	Hard Copy File Location	Archived?	Archive Location	Deleted / Disposed?	Notes

MASTER DOCUMENT LIST

Item No	Document / Record Name, Description, Version	Transmittal Number	Transmittal Date	Transmitted By	Transmitted To	Electronic File Location	Hard Copy File Location	Archived?	Archive Location	Deleted / Disposed?	Notes

Appendix A.2

Request for Information Form (Form 270)

CH2MHILL

CONTRACT CLARIFICATION/ INTERPRETATION REQUEST

CCIR NO: _____

_____

PROJECT: _____ PROJECT NO: _____

CONTRACTOR: _____

Clarification/Interpretation Initiated By: _____

Regarding: Plan Sheet _____ of _____ Spec. Section: _____

Description:

_____
Prepared by

_____
Date

Response Assigned to:

_____
Signed

_____
Date

REV 10/95
FORM 270

Appendix A.3

Change Order Form (Form 273)

FORM NO.	273
TITLE:	Change Order
PURPOSE:	Provides contractual means for ordering modifications to the contract documents.
PREPARED BY:	Engineer or owner
DIRECTED TO:	Contractor
COPIES TO:	Engineer, owner, resident project representative
COMMENTS:	All revisions to the contract documents involving changes to the contract cost or contract times, must be documented using this form.

CH2MHILL

CHANGE ORDER

CHANGE ORDER NO.[1]: _____

TO CONTRACTOR: _____

PROJECT: _____ PROJECT NO: _____

OWNER: _____

ENGINEER: _____

The following modification(s) to the Contract are hereby ordered (use additional pages if required):

Reason for Modification(s):

Attachments (List Supporting Documents):

Contract Amount or Price		Contract Times (Calculate Days)	
Original	$ _____	Original Duration	_____ Days
Previous Change Order(s) (Add/Deduct)	$ _____	Previous Change Order(s) (Add/Deduct)	_____ Days
This Change Order (Add/Deduct)	$ _____	This Change Order (Add/Deduct)	_____ Days
Revised Contract Amount	$ _____	Revised Contract Time	_____ Days

The Revised Contract Completion Date is:

_____, 20 _____

Owner	Contractor	Engineer Recommendation
By: _____	By: _____	By: _____
Date: _____	Date: _____	Date: _____

[1] Number all Change Orders consecutively.

Copies: Owner
Field File

Appendix A.4

Field Order Form (Form 275)

FORM NO. 275
TITLE: Field Order

PURPOSE: Orders minor revisions to the contract documents which do not involve changes in the contract price or contract times.

PREPARED BY: Engineer

DIRECTED TO: Contractor

COPIES TO: Owner, resident project representative

COMMENTS: Use sparingly; if the revision involves changes in the contract price or times, either a Change Order or Written Amendment should be implemented.

CH2MHILL

FIELD ORDER

TO CONTRACTOR: _____ FIELD ORDER NO: _____

PROJECT: _____ PROJECT NO: _____

OWNER: _____

ENGINEER: _____

The following minor changes in the work have been ordered and authorized:

Description of Changes:

Reason for Field Order:

Reference Drawing sheets and section(s) or detail(s):

Reference Specification section(s)/paragraph(s):

The intent of this Field Order is to authorize minor variations to the Contract Documents not involving a change in Contract Price or Contract Times and which are compatible with the design concept of the completed Project. This Field Order is binding upon OWNER and also on CONTRACTOR who will perform the work promptly. If OWNER or CONTRACTOR believes an adjustment to the Contract Price or Contract Times is necessary, the party may make a claim therefore in accordance with the General Conditions.

Issued by Engineer:

By: _____
Authorized Representative

Date: _____

Contractor Receipt Acknowledgement:

By: _____

Title: _____

Date: _____

Copy:
1. Owner
2. Field File

Appendix A.5

Transmittal Form (Form 295)

CH2MHILL

TRANSMITTAL OF CONTRACTOR'S SUBMITTAL

(ATTACH TO EACH SUBMITTAL)

DATE: _____

TO: _____

_____

_____

_____

_____

Submittal No.: _____

☐ New Submittal ☐ Resubmittal

Project: _____

Project No.: _____

Specification Section No.: _____

(Cover only one section with each transmittal)

FROM: _____

Contractor

_____

_____

_____

Schedule Date of Submittal:

_____

SUBMITTAL TYPE: ☐ Shop Drawing ☐ Sample ☐ Informational

The following items are hereby submitted:

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

CONTRACTOR hereby certifies that (i) CONTRACTOR has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By: _____

CONTRACTOR (Authorized Signature)

Appendix A.6

Routing of Submittal Form (Form 296)

CH2MHILL

ROUTING OF CONTRACTOR'S SUBMITTALS

DATE: _____ PROJECT NO: _____

PROJECT: _____

CONTRACTOR: _____

SUBMITTAL NO: _____

DATE OF CONTRACTORS SUBMITTAL: _____

Is Hereby Transmitted For Action: _____

Item: _____

Specification Action: _____

To	Initials & Date	Hours	Target Date

Comments:

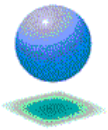
Copies:

Copies:
1. Retained at Resident Inspector's office.
2. To Project Manager with diary sheet for the day.
3. To Contractor's Representative.

Appendix A.7

Submittal Review Comments Form (Form 299SR)

SUBMITTAL REVIEW COMMENTS



CH2MHILL

DATE: _____ **PROJECT:** _____

SUBMITTAL NO.: _____ **PROJECT NO.:** _____

SPEC SECTION: _____ **REVIEWER NAME:** _____

DESCRIPTION: _____ **PAGE:** _____

SUBMITTAL TYPE: ☐**SHOP DRAWING** ☐**SAMPLE** ☐**INFORMATION**

☐ 1. APPROVED	☐ 5. REVISE & RESUBMIT - Resubmittal required
☐ 2. APPROVED AS NOTED	☐ 6. NOT SUBJECT TO REVIEW
☐ 3. PARTIAL APPROVAL – RESUBMIT AS NOTED Resubmittal required	

NO.	COMMENT	RELATED SPEC PARA./ DRAWING #

REV 03/02
Form 299SR

Appendix A.8

Non-Conformance Report (Form 442)

FORM NO. 442
TITLE: Defective/Rejected Work Notification

PURPOSE: Written notice of deficiencies or rejection of work and a demand for corrective action.

PREPARED BY: Engineer or resident project representative

DIRECTED TO: Contractor

COPIES TO: Owner, engineer

COMMENTS: Description should contain accurate locations and specification references. The document may figure strongly in later contractor claims. EJCDC General Conditions require that “deficiencies” in the work be corrected; while “rejected” work must be removed and replaced.

CH2MHILL

DEFECTIVE/REJECTED WORK NOTIFICATION

TO CONTRACTOR: _____ NOTIFICATION NO: _____

PROJECT: _____ PROJECT NO: _____

OWNER: _____ TIME: _____ AM/PM

ENGINEER: _____ OBSERVER: _____

Pursuant to the GENERAL CONDITIONS of the Contract, you are hereby notified of the following noncompliance violation:

Specification Section: _____ Paragraph: _____

Violation:

Contract Requirement:

Violation Detected by: ☐ Test ☐ Inspection ☐ Observation

Noncompliance Work is: ☐ Defective ☐ Rejected

Estimated Value of Noncomplying Work: $ _____

Defective work shall be corrected. Rejected work shall be removed and replaced. All costs shall be borne by the Contractor. Payment will not be made for defective or rejected work. Contractor shall notify Engineer when defective or rejected work is corrected.

Received by:

Engineer: _____
Authorized Representative

Date: _____

_____
Contractor

_____
Title

_____
Date

Distribution:
1. Engineer
2. Owner
3. Field File

Appendix A.9

Non-Conformance Report Log (Form 444)

CH2MHILL

DEFECTIVE/REJECTED WORK NOTIFICATION LOG

PAGE: 1

PROJECT: ______________________ PROJECT NO: ______________________

CONTRACTOR: ______________________

Notification Number	Date	Spec Section	Defective/Rejected Work	Accepted	
				By	Date

Appendix A.10

Notification of Correction of Non-Conformance (Form 443)

NOTIFICATION OF CORRECTION OF DEFECTIVE/REJECTED WORK

TO CONTRACTOR: _____ PREVIOUS NOTIFICATION NO: _____ DATE: _____

PROJECT: _____ PROJECT NO: _____

OWNER: _____

ENGINEER: _____

The below listed Defective/Rejected work has been reinspected and the results of the Contractor's corrective actions have placed the work in compliance with the Contract Documents.

Description of Violation:

Description of Correction:

Engineer: _____
Authorized Representative

Date: _____

Distribution:
1. Engineer
2. Owner
3. Field File

Appendix A.11

Notification Testing Plan Log (SOP ES-P6-05)

TESTING PLAN AND LOG

Project Name:	Project Number:	Testing Plan Prepared By:	Date Prepared:
Project Quality Manager:	Field Quality Manager:	Testing Log Checked By:	Date(s) Checked:

TESTING PLAN					TESTING LOG				
Source Reference	Test Required	Method Reference	Frequency	Notes	Sampled By	Tested By	Location of Test (on-site/ off-site)	Date Test Completed	Remarks

Appendix A.12

Daily Production and Quality Control Report Form (CQMM-017)

CH2MHILL CONTRACT NAME: CONTRACT NO:	**DAILY REPORT** SOP CQMM-017, Version 1 (ATTACH ADDITIONAL SHEETS IF NECESSARY)	REPORT DATE : REVISION NO: REVISION DATE: REPORT NO:

TASK ORDER NO:	PROJECT NAME / LOCATION:		
PROJECT NUMBER:	PROJECT DESCRIPTION:		
PROJECT MANAGER:		PROJECT QC MANAGER:	
CONSTRUCTION MANAGER:		SITE SAFETY MANAGER:	
AM WEATHER:	PM WEATHER:	MAX TEMP: F	MIN TEMP: F

SUMMARY OF WORK PERFORMED TODAY

HEALTH AND SAFETY REPORT

SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED (Include Observations, Safety Violations, Corrective Instructions Given, Corrective Actions Taken, and Results of Safety Inspections Conducted):

-
-

TAILGATE TOPICS:

-
-

OPERATIONS / PRODUCTION REPORT

WORK FORCE – CONTRACTOR AND SUBCONTRACTOR

Company	Cumulative Total of Work Hours From Previous Report	Total Hours Today	Total Work Hours From Start of Construction
CH2MHILL			

EQUIPMENT ON HAND

Description of Equipment	Make/Model/Manufacturer	Equipment ID Number	Inspection Performed By

COMMENTS (acceptance status, inspection findings, etc.):

WORK AND/OR TESTS ACCOMPLISHED OR IN PROGRESS

Performed Work / Test for Today:

-
-
-

Planned Work / Test for Tomorrow:

-
-
-

Planned Work / Test for Next Week:

-
-
-

CHANGED CONDITIONS/DELAY/CONFLICTS ENCOUNTERED (List any conflicts with the project [i.e., scope of work and/or drawings], delays to the project attributable to site and weather conditions, etc.)**:**

-
-

VISITORS AND DISCUSSIONS:

-
-

QUALITY CONTROL REPORT

MATERIALS DELIVERED TO JOB SITE

Quantity/Volume/ Weight	Description of Materials Received	Make/Model/Manufacturer	Material Lot Number	Inspection Performed By

COMMENTS (acceptance status, inspection findings, etc.):

INSPECTIONS PERFORMED

Task/Activity Inspected	Inspection Performed	Findings

TESTS PERFORMED

Task/Activity Tested	Test Performed	Test Results (Pass/Fail) - Criteria

QUALITY ISSUES AND RESOLUTIONS:

-
-
-

SUBMITTALS INSPECTION / REVIEW

Submittal No.	Submittal Description	Specification/Plan Reference	Submittal Approved?	Comment/Reason/Action
			Yes ☐ No ☐	
			Yes ☐ No ☐	
			Yes ☐ No ☐	
			Yes ☐ No ☐	

REGULATORY COMPLIANCE REPORT

PERMIT INSPECTIONS PERFORMED:

WASTE ACCUMULATION/STOCKPILE AREA INSPECTION							
Inspection Performed By:				Signature of Inspector:			
Accumulation / Stockpile Area Inspected:							
No of Containers::		No of Tanks		No of Roll-Off Boxes::		No. of Drums	
Inspection Results:							
GENERAL COMMENTS							
General Comments~ (rework, directives, etc.):							
ATTACHMENTS							
List of Attachments: (examples, as applicable: submittals, meeting minutes, safety meeting minutes,, COCs, weight tickets, manifests, profiles, rework item list, RFIs, DCNs, etc.):							
NOTE: Write all entries legibly in ink. Line out all unused portions or designate as "not applicable". Preparer signs first and last name on each completed daily report. This form may be filled out electronically and signed electronically.				PREPARER'S SIGNATURE		DATE	
PHOTOGRAPHS TAKEN THIS DATE:							
SUBJECT :							
PHOTO LOG NO.S:							

Appendix A.13

Critical Inspection Log (SOP ES-P6-12)

CH2MHILL Constructors, Inc.

Critical Inspection Log

DATE OF REPORT **mm/dd/yyyy:**
REVISION NO #
REVISION DATE mm/dd/yyyy:

PROJECT NO:		**PROJECT NAME:**		**Inspection Description**									
DFOW No.	Definable Feature of Work	Technical Spec Section(s)	Article No.	Critical Review / Inspection Activities (list review/inspection REQUIREMENTS for QC)	Submittal Required (Y/N)	Submittal Approved (Y/N)	AHA Prepared & Submitted	Preliminary Work Completed (Y/N)	Testing / Sampling (Y/N)	Critical Photographs	Daily Inspection Report No.(s)	COMMENTS
1	"Narrative DFOW scope"			1								
				2								
				3								
				4								
				5								
	Subtask:			6								
				7								
				8								
				9								
				10								
2	"Narrative DFOW scope"			1								
				2								
				3								
				4								
				5								
	Subtask:			6								
				7								
				8								
				9								
				10								
3	"Narrative DFOW scope"			1								
				2								
				3								
				4								
				5								
	Subtask:			6								
				7								
				8								
				9								
				10								
4	"Narrative DFOW scope"			1								
				2								
				3								
				4								
				5								
	Subtask:			6								
				7								
				8								
				9								
				10								
5	"Narrative DFOW scope"			1								
				2								
				3								
				4								
				5								
	Subtask:			6								
				7								
				8								
				9								
				10								
6	"Narrative DFOW scope"			1								
				2								
				3								
				4								
				5								
	Subtask:			6								
				7								
				8								

CH2MHILL Constructors, Inc.

Critical Inspection Log

DATE OF REPORT **mm/dd/yyyy:**
REVISION NO #
REVISION DATE mm/dd/yyyy:

PROJECT NO:		**PROJECT NAME:**		**Inspection Description**								
DFOW No.	Definable Feature of Work	Technical Spec Section(s)	Article No.	Critical Review / Inspection Activities (list review/inspection REQUIREMENTS for QC)	Submittal Required (Y/N)	Submittal Approved (Y/N)	AHA Prepared & Submitted	Preliminary Work Completed (Y/N)	Testing / Sampling (Y/N)	Critical Photographs	Daily Inspection Report No.(s)	COMMENTS
				9								
				10								

Appendix A.14

Photo Log Template (Form 303)

CH2MHILL

PHOTO RECORD FILE INDEX

ROLL NO: _____

PERIOD FROM: _____ TO _____ 20 ____

PROJECT: _____ PROJECT NO: _____

PREPARED BY: _____

Picture Number	Photo Description/Location	Date	Daily Log Number

Appendix A.15

Transportation and Disposal Log (SOP ES-P6-01)

Transportation & Disposal Log

PROJECT NAME:						SUBCONTRACTOR:					
CTO NO:											
Site / Task / Activity	**Contnr Type**	**Contnr Desig**	**Waste Prof Samp No**	**Transporter**	**Date Transported**	**Transporter EPA ID**	**Load ID**	**Disp Fac**	**Disp Fac EPA ID**	**Media**	**Waste Type (Haz, Nonhaz, TSCA, etc)**

Appendix B

Quality Assurance Requirements for the Construction Implementation

APPENDIX B

Quality Assurance Requirements

Summary of Work (01 11 00)

Submittals

Prior to Award

- Certificate of insurance naming U.S. Environmental Protection Agency (USEPA) and Contractor as additional insured and waivers of subrogation against USEPA and Contractor.
- Completed certification of compliant drug policy.
- Subcontractor's site-specific health and safety plan and Activity Hazard Analysis (AHA) worksheets.
- Proof of training and medical monitoring programs.
- Material safety data sheets (MSDSs).
- Copies of Subcontractors' and business licenses as required by state and local statutes.

After Award

- Subcontractor shall provide the following before the commencement of any Work onsite:
  - Current hazardous waste site training and medical surveillance documentation for all field personnel, as necessary.
  - Project Schedule and schedule narrative of Subcontractor's approach in performing the Work. The narrative will identify equipment, labor resources, crews and subcontracts. The narrative will also discuss project coordination.
  - Contractor Quality Control Plan.
  - Work Plan
  - Storm Water Management Plan
  - Waste Management Plan.
- Subcontractor shall provide the following submittals during execution of the Work:
  - Daily reports
  - Summary of remedial actions completed at each property, including any deviations from the specified SOW.
  - Weekly updated schedule of values.
  - Progress schedule and narrative report.
  - As-built redline drawings of all excavation areas with lateral and vertical limits of excavation. Beginning and ending elevation of excavation areas confirmed and documented using survey.
  - A table documenting information on wastes managed, including quantities generated at each location and disposition of wastes.

- Action and informational submittals required by the technical specification.

Tests

None required.

Samples

None required.

Observations

None required.

Payment Procedures (01 29 00)

Submittals

- Schedule of Values
- Schedule of Estimated Progress Payments
- Application for Payment
- Weight or load slips from certified scales
- Final Application for Payment

Tests

None required.

Samples

None required.

Observations

None required.

Project Coordination (01 31 13)

Submittals

Informational Submittals

- Job Hazard Analysis or Activity Hazard Analysis (JHA or AHA)
- Utility locate tickets
- Photographs (Contractor)
- Digital Video Recordings (Contractor)

Action Submittals

- Property Sketch showing Existing Conditions
- Property Sketch showing Restoration and Replacement Plan
- Survey Documentation

Tests

None required.

Samples

None required.

Observations

- Verify that signed access agreements for the current property owner are in the file with approvals from the preconstruction meeting with the property owner prior to beginning work.
- Observe that utilities have been identified and marked prior to beginning excavation on each property.
- Observe that one point of continuous access for residents and Property Owners is maintained with a second point as possible.
- Observe that openings in fences are secured at the end of each work day.
- Observe pre-existing conditions with video and photography as documentation paying particular attention to areas which could be damaged by construction.

Construction Progress Documentation (01 32 00)

Submittals

- Preliminary Progress Schedule
- Detailed Progress Schedule with accompanying Documentation
- Final Updated Progress Schedule

Tests

None required.

Samples

None required.

Observations

None required.

Subcontractor Quality Control (01 45 16.13)

Submittals

- Contractor Quality Control (CQC) Report Format
- CQC Plan
- CQC Report

Samples

None required.

Temporary Facilities and Controls (01 50 00)

Submittals

- Required permits and approvals
- Field office and staging area plans
- Fencing and protective barrier locations and details
- Stormwater Management Plan
- Environmental Control Plan
- Transportation Plan
- Traffic Control and Routing Plan
- Excavation Water Submittals

Products

- Temporary Stockpile Covering
- Silt Fence
- Straw Mulch/Bales
- Other Erosion and Sediment Control Items
- High-Visibility Fence
- Barricades and Lights
- Signs and Equipment

Tests

Dust monitoring – Acceptable maximum particulate matter concentration of 75 $\mu g/m^3$ and mean concentration of 60 $\mu g/m^3$.

Samples

- Contractor shall characterize excavation water as required by applicable laws and regulations.

Observations

- Observe that residences and businesses are not cut off from vehicular traffic, unless special arrangements have been made and approved by the Contractor.
- Observe that underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations are protected, shored, braced, supported, and maintained.
- Observe that fire hydrants and water control valves are free from obstruction and available for use at all times.
- Observe that construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris do not enter sewers, pump stations, or other sewer structures.

- Observe that the erosion control measures are installed according to best management practices and the Stormwater Management Plan.
- Observe that barricades are used as required by the Vehicle Code and in sufficient quantity to safeguard public and the Work.
- Observe that earthwork and trucking operations are conducted to minimize dust and adhere to applicable environmental regulations for dust prevention.
- Observe that construction equipment is only operated between the hours of 7:00 a.m. and 6:00 p.m in accordance with City Ordinance.
- Observe that the Earthwork Subcontractor complies with the provisions of the Storm Water Management Plan.
- Observe that street closings or restrictions comply with Laws and Regulations and with written permission of proper authority.
- Observe that water control systems of sufficient size and capacity are provided, operated, and maintained to limit water collection in excavations and permit backfilled to final grade.
- Observe that excavation water is discharged, as approved, in manner that will not cause contamination, erosion, or flooding, or otherwise damage existing facilities, completed Work, or adjacent property or is sent offsite for treatment and disposal at the direction of the Contractor.
- Observe that field equipment that has come into contact with any potentially contaminated material is decontaminated before leaving the site.
- Observe that all field equipment, temporary facilities, and other miscellaneous items (for example, barricades, caution tapes, and signs) resulting from or used during field operations are removed and properly disposed of offsite prior to demobilization.

Closeout Procedures by the Subcontractor (01 77 00)

Submittals

- Record Documents
- Special Bonds, Special Guarantees, and Service Agreements
- Consent of Surety to Final Payment
- Releases or Waivers of Liens and Claims
- Releases from Agreements
- Final Invoice for Payment

Tests

None required.

Samples

None required.

Observations

None required.

Site Clearing and Grubbing (31 10 00)

Submittals

- Drawings clearly showing clearing and grubbing limit
- AHA drawings for each property

Tests

None required.

Samples

None required.

Observations

- Observe that excavation areas are surveyed by Survey Subcontractor to establish preconstruction control points and existing elevations.
- Observe that trees, shrubs, vegetation, and encumbrances are removed or protected prior to soil excavation.
- Observe that tree stumps and roots required to be removed are mulched and disposed of with the soil.
- Observe that trees, shrubs and other aboveground vegetation required to be removed are disposed of at a disposal facility approved by the Contractor.
- Observe that surface debris such as bricks, concrete pieces and other materials that will not be stored and reused, are segregated, cleaned of soil and vegetation and disposed of as non-contaminated waste.
- Observe that erosion controls are installed in accordance with the Stormwater Management Plan and best management practices prior to excavation.
- Observe that obstructions removed from the property are securely stored and returned upon completion of restoration.
- Observe that special landscaping features such as active sprinkler systems, electrical, plumbing and drain tile within the limits of excavation are identified prior to excavation.
- Observe that clearing, grubbing and excavation does not extend beyond excavation limits established on documents and drawings finalized during the residential preconstruction meeting.
- Observe that all grasses or groundcover that remains between the excavation and the permanent structure or fence are manually removed.
- Observe that sufficient information is recorded prior to removal to uniquely identify each plant for accurate replacement.
- Observe that only trees designated for removal are removed.
- Observe that shrubs, brush, weeds, and grasses are cut to within 2 inches of ground surface.

Excavation (31 23 16)

Submittals

- Excavation Plan
- Copies of haul tickets

Tests

- Dust monitoring – Acceptable maximum particulate matter concentration of 75 µg/m^3 and mean concentration of 60 µg/m^3.
- Soil screening with x-ray fluorescence to determine the extent of excavation and need for demarcation fabric.
- Contractor shall collect one TCLP soil sample for every 500 ton of soil excavated.

Products

- High-Visibility Construction Fence

Observations

- Observe that construction equipment is only operated between the hours of 7:00 a.m. and 6:00 p.m in accordance with the City Ordinance.
- Observe that appropriate excavation methods are selected where limited access a higher potential for damage to property exist. Limit the excavation as necessary to prevent property damage or safety hazards.
- Observe that adequate controls are in place to avoid unauthorized overexcavation.
- Observe that stockpiled excavated material is covered and protected during inclement weather.
- Observe that the excavation boundaries are consistent with those determined during Residential Preconstruction Meetings with concurrence from the Property Owner.
- Observe that excavation proceeds to the appropriate depth prior to screening for arsenic using x-ray fluorescence.
- Observe that obstructions are removed or protected.
- Observe that construction barrier fence is installed around the excavation perimeter to separate pedestrian traffic from the work.
- Observe that hand digging is performed within 2 feet of underground utility markings to verify actual location of the utility.
- Observe that manual excavation is performed within the drip line.
- Observe that specified lines and grades and sampling and analysis indicate extents of excavation have been reached prior to authorizing backfilling of the excavation.
- Observe that excavated material is not stockpiled overnight except within approved areas of the staging area and is not at any time placed adjacent to excavations, not on street surface or adjacent property.
- Observe that trees and plantings that are not being removed are protected and appropriate measures are taken when excavating around the plants, including avoiding, or minimizing damage to roots systems.

- Observe that the Work is performed in accordance with the Stormwater Management Plan.
- Observe that all moving, handling and loading of excavated material is in accordance with the Subcontractor's Transportation Plan.
- Observe that trucks are loaded in an area with temporary ground cover, such as a tarp, where possible to minimize the potential for soil to spill into roadways.
- Observe that the Subcontractor complies with the following procedures when transporting wastes offsite:
  - Transporting waste materials shall comply with requirements of MNDOT Standard Specifications.
  - Minimize impacts to general public traffic.
  - Repair road damage caused by construction and/or hauling traffic.
  - Clean up material spilled in transit.
  - Follow safety and spill response procedures.
  - Use sealed trucks transporting liquids or wet materials.
  - No materials from other projects shall be combined with materials from this site.
  - Comply with Traffic Control Plan.

Fill and Backfill (31 23 23)

Submittals

- Identification of proposed borrow source(s)
- In place compaction testing results
- Manufacturer's data sheets for compaction equipment.

Samples

- Samples will be collected by the Contractor and analyzed by the Analytical Laboratory for the following:
  - Imported material taken at source
  - Chemical analyses of source materials
  - Gradation analyses of source materials

Tests

- The Earthwork Subcontractor shall perform 1 in-place compaction test per lift for each excavation area.
- The Contractor shall collect samples for target compound list (TCL) organics and target analyte list (TAL) metals when identifying borrow source(s) to be used for fill material.
- The Contractor shall collect one TCL organics and TAL metals sample per 1,000 yd^3 of fill material. The fill will meet the Minnesota Pollution Control Agency (MPCA) Tier I Residential Soil Reference Values (SRVs).
- The Contractor shall collect one gradation test per source material submitted for approval before material is supplied to the site.

- The Contractor shall collect one sample from each 1,000 yd^3 for gradation or more often as determined by Contractor, if variation is occurring or if material appears to depart from Specifications.
- The Contractor will submit a sample from the borrow source to determine the maximum dry density as determined by ASTM D698 (Standard Proctor).
- The Earthwork Subcontractor shall perform 1 in-place compaction test per lift for each excavation area. Compaction of 90 to 95 percent maximum dry density.

Products

Backfill

- Natural soils that include fine or coarse grained soils, clay, clayey sand, and other natural-approved material.
- Backfill material shall be free from rocks larger than 3 inches, from roots, peat and other organic matter, ashes, cinders, trash, debris, and other deleterious materials.
- Backfill containing more than 10 percent gravel, stones, or shale particles is unacceptable.

Granular Fill

- Pit-run or crusher-run material that is so graded from coarse to fine, that the ratio of the portion passing the 75 um (#200) sieve divided by the portion passing the 25 mm (1 inch) sieve may not exceed 20 percent by mass.
- Shall not contain oversize salvaged bituminous particles or stone, rock, or concrete fragments in excess of the quantity or size permissible for placement.
- Free from dirt, clay balls, and organic material.

Water for Moisture Conditioning

- Water for moisture conditioning shall be free of hazardous or toxic contaminants, or contaminants deleterious to proper compaction.

High Visibility Fence

- Orange high-density polyethylene

Demarcation Fabric

- Orange high-density polyethylene fence
- Mifari ® orange delineation geotextile or approved equivalent.

Detectable Marking Tape

- Pro-Line® Detectable Marking Tape
- Terra Tape® Sentry Line™
- 4-inches wide, red in color
- Printed to read "CAUTION: POTENTIAL DANGER OF ARSENIC CONTAMINATION BELOW"

Observations

- Observe that placement surfaces are free of water, debris and foreign materials during placement and compaction of fill and backfill materials.
- Observe that backfill material is placed in no greater than 6-inch lifts and compacted to between 90 and 95 percent maximum dry density as determined by ASTM D698 (Standard Proctor) up to the depth of topsoil specified.
- Observe that backfilled areas are compacted in a manner that prevents differential settlement, sink holes, subsidence, etc., and shall warrant against same for 1 year.
- Observe that backfill is not placed in excavations with standing water or unstable subgrade conditions. Backfill shall be placed in a manner that does not disturb or damage surrounding structures or utilities.
- Observe that backfilled areas are graded away from structures to suit the elevation of the surrounding area and such that there will be no ponding of water.
- Observe that backfill materials are placed in horizontal lifts of uniform thickness, in a manner that avoids segregation, and compact each lift to specified densities prior to placing succeeding lifts. Slope lifts only where necessary to conform to final grades or as necessary to keep placement surfaces drained of water.
- Observe that the level of backfill is kept even around each structure.
- Observe that backfill is not place on a frozen surface.
- Observe that sections of prepared ground surface are not used as haul roads and are protected from traffic.
- Observe that prepared ground surface is maintained in finished condition until next course is placed.
- Observe that backfill is performed within a tolerance of 0.1 foot unless dimensions or grades are shown or specified otherwise.
- Observe that demarcation fabric is placed in the bottom of the excavation at properties as directed by the Contractor. Demarcation fabric shall be placed flat in the excavation with a minimum 6 inch overlap and a minimum 6 inches up the sides.
- Observe that detectable marking tape is placed on 3-foot centers on top of the demarcation fabric.
- Observe that within influence area adjacent to or beneath structures, sidewalks, slabs, pavements, curbs, piping, conduits, and other facilities, backfill material is approved by Contractor. Specified material includes backfill or granular fill as determined appropriate by Contractor. Place fill in lifts of 6-inch maximum thickness and compact each lift to minimum of 90 percent relative compaction as determined in accordance with ASTM D698.
- Observe that excavation carried below grade lines shown or established by Contractor is filled with the same material as specified for overlying fill or backfill.

Site Restoration (32 10 01)

Submittals

Informational Submittals

- Manufacturer's Instructions or data sheets for replacement materials.

Action Submittals

- Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
- Samples of replacement materials.
- Results of inspection and testing of existing systems

Tests

- Inspection or testing of existing systems

Samples

- Replacement materials.

Observations

- Observe that Work does not commence until the Contractor has approved materials and methods proposed for restoration.
- Observe that the Earthwork Subcontractor reinstalls removed obstructions, repairs damage to permanent structures, and repair or replacement of property disturbed or damaged during or as a result of the Earthwork Subcontractors construction activities.
- Observe that temporary controls are removed with the exception of erosion control measures which will remain in place until the end of water period or establishment of sufficient stand of grass.
- Observe testing of existing systems in or near excavation areas, such as irrigation systems, electrical, plumbing, or other to verify proper function.
- Observe that the Earthwork Subcontractor repairs damage to private property, including but not limited to, fencing, private utilities, and permanent structures, in accordance with manufacturer's instructions, local codes and ordinances, and other applicable regulations and as approved by the Contractor.
- Observe that repairs are performed to an equivalent or better quality than the original. Repairs shall be made with like-kind materials with matching finishes as possible.
- Observe that the Earthwork Subcontractor repair sidewalks, curb and gutter, trees or other City property damaged by the Earthwork Subcontractor or as a result of their construction activities. Repairs shall be performed in accordance with the MnDOT Standard Specifications for Construction amended as appropriate with the City of Minneapolis Special Provisions or other applicable ordinances or regulations.
- Observe that the applicable utilities are notified if damage occurs during the Work.
- Observe that debris, rubbish and excess materials are removed from the property for storage at the staging area or disposal, as appropriate. Local regulations regarding hauling and disposal shall apply.

Chain Link Fences and Gates (32 31 13)

Submittals

Informational Submittals

- Manufacturer's recommended installation instructions
- Evidence of supplier and installer qualifications

Action Submittals

- Product Data: Include construction details, material descriptions, dimensions of individual components, and finishes for chain link fences and gates.
  - Fence, gate posts, rails, and fittings
  - Chain link fabric
  - Gates and hardware
- Samples:
  - Chain Link Fabric: Approximately 6 inches square
  - Posts, Rails, Braces, Wire, and Ties: Approximately 6 inches long
  - Fittings: 1 each
  - Privacy fabric and fasteners

Tests

- Post and Fabric Testing: Test fabric tension and line post rigidity according to ASTM F1916.
- Gate Tests:
  - Prior to acceptance of installed gates, demonstrate proper operation of gates under each possible open and close condition specified.
  - Adjust gate to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range.
  - Confirm that latches and locks engage accurately and securely without forcing and binding.

Observations

- Observe that the materials are delivered to Site in undamaged condition and stored off the ground to provide protection against oxidation caused by ground contact.
- Observe that utility clearances are coordinated at each property through the local one-call system (Gopher State One Call) prior to performing work.
- Observe that chain link fences and gates are installed in accordance with ASTM F567, except as modified in this section, and in accordance with fence manufacturer's recommendations, as approved by Engineer. Erect fencing in straight lines between angle points.
- Observe that any damage to galvanized surfaces, including welding, is repaired with paint containing zinc dust in accordance with ASTM A780.

- Observe that locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments are marked when staking the location of the fence line.
- Observe that postholes are drilled or hand-excavated to a minimum 3 feet below finished grade and 2 inches deeper than post embedment depth below finish grade.
- Observe that posts are set with minimum embedment below finished grade of 34 inches and with top rail at proper height above finished grade. Verify posts are set plumb, aligned, and at correct height and spacing.
- Observe that postholes are backfilled with concrete to 2 inches above finished grade. The top of concrete should be crowned and finished to readily shed water.
- Observe that line posts are spaced uniformly at 10 feet on centers between terminal end, corner, and gate posts.
- Observe that chain link fabric is not installed until concrete has cured minimum 7 days.
- Observe that 2 inches exists between finish grade or surface and bottom selvage, unless otherwise indicated.
- Observe that gate stops are set in concrete to engage center drop rod or plunger bar.
- Observe that excess fencing materials and other debris are removed from Site.

Topsoil Preparation (32 91 13)

Submittals

- Identification of proposed borrow source(s)
- Certified Topsoil Analysis Reports:
  - Nutrient/gradation results.
  - Indicate quantity of lime, and quantity and analysis of fertilizer.
- In place compaction testing results
- Compost certification

Tests

- Soil Analysis/Testing: Current standard testing procedure of the University of Minnesota, Soil Science Department, Soils Testing Laboratory for determining pH, percent of organic matter, extractible phosphorus, exchangeable potassium, and soluble salts.
- The Contractor will collect samples for target compound list (TCL) organics and target analyte list (TAL) metals when identifying borrow source(s) to be used for topsoil.
- The Contractor will also collect one TCL organics and TAL metals sample per 1,000 yd^3 of topsoil. The topsoil will meet the MPCA Tier I Residential SRVs.
- The Contractor will submit a sample from the borrow source to determine the maximum dry density as determined by ASTM D698 (Standard Proctor).
- The Earthwork Subcontractor shall perform 1 in-place compaction test per lift for each excavation area. Topsoil should be compacted to between 80 and 85 percent maximum dry density.
- The Contractor will also collect one TCL organics and TAL metals sample per 1,000 yd3 of compost. The compost will meet the MPCA Tier I Residential SRVs.

Products

- **Topsoil Borrow**: Topsoil for general use as a turf growing medium shall meet the requirements of Table 3877-1 as specified in MnDOT Standard Specification 3877 - Topsoil Borrow and as described below:

TABLE 3877-1
Topsoil Borrow Requirements

	Minimum	Maximum
Material Passing 2.00 mm (#10) Sieve	85%	--
Clay	5%	30%
Silt	10%	70%
Sand & Gravel	10%	70%
Organic Matter	3%	20%
pH	6.1	7.8

- **Select Topsoil Borrow:** Select topsoil for use as a plant growing medium in designated areas, such as gardens and landscape beds, shall meet the requirements of Table 3877-2 as specified in MnDOT Standard Specification 3877 Topsoil Borrow and as described below:

TABLE 3877-2
Select Topsoil Borrow Requirements

	Minimum	**Maximum**
Material Passing 2.00 mm (#10) Sieve	90%	--
Clay	5%	30%
Silt	10%	70%
Sand & Gravel	20%	70%
Organic Matter	3%	20%
pH	6.1	7.5
Extractible Phosphorous	30 kg per hectare (26.8 pounds/acre)	--
Exchangeable Potassium	150 kg per hectare (133.8 pounds/acre)	--
Soluble Salts	--	0.15 siemens per meter (1.5 mmho/cm)

- **Peat (if required)**
  - Composition: Natural residue formed by decomposition of reeds, sedges, or mosses in a freshwater environment, free from lumps, roots, and stones.

  - Organic Matter: Not less than 90 percent on a dry weight basis.
  - Moisture Content: Maximum 65 percent by weight at time of delivery.

- **Compost**
  - Mature and usable when 60 percent decomposition has been achieved as determined by an ignition-loss analysis and any one additional test method including the Solvita test of 5 or above.
  - Compost product has no offensive smell, no identifiable organic materials, and will not reheat more than 11 ºC (20 ºF) degrees above ambient temperature.

Observations

- Observe that Work specified in Section 31 23 23, Fill and Backfill is completed and rough graded prior to placing topsoil.
- Observe that topsoil is not placed when subsoil or topsoil is frozen, excessively wet, or otherwise detrimental to the Work.
- Observe that lime and soil amendments are mixed with topsoil before placement or spread on topsoil and mixed thoroughly into entire depth of topsoil before placing seed.
- Observe that topsoil is placed to a minimum depth of 6 inches under seed areas.
- Observe that select topsoil is placed in garden areas to a depth of 18 inches below final grade.
- Observe that topsoil is fine graded to eliminate rough or low areas and maintain levels, profiles, and contours of subgrade to within +0.1 foot of final grade.
- Observe that stones exceeding 1 ½ inches, roots, sticks, debris, and foreign matter are removed during and after topsoil placement.
- Observe that one (1) part compost is mixed with three (3) parts topsoil and uniformly mixed prior to compaction and final grading only when requested by the Property Owner and at the direction of the Contractor.

Turf and Grasses (32 92 00)

Submittals

- Certification of seed
- Certification of sod
- Description of required maintenance
- Watering plan and schedule
- Standard and organic fertilizer products proposed for use
- Product labels/data sheets

Products

Grass Seed

MIXTURE: 270

	Bulk Rate		% of Mix
	kg/ac	lb/ac	Component
Blue Grass, Kentucky – Elite	33.6	30	25.0

Blue Grass, Kentucky – Improved	33.6	30	25.0
Blue Grass, Kentucky – Low Maintenance	33.6	30	25.0
Red fescue, creeping	10.8	9.6	8.0
Rye-grass, perennial	22.8	20.4	17.0
GRAND TOTALS:	**134.4**	**120**	**100.0**
Purpose: Residential Turf			

Hydromulch

- In accordance with MnDOT Standard Specification 3884 - Hydraulic Soil Stabilizer, hydromulch shall be Type 5–Hydromulch or Type 6–Hydromulch Blend as approved by the Contractor.

Sod

- Certified, species native to that area. At least two-thirds of the grasses, as determined by initial seeding proportions, shall be of improved and elite type Kentucky bluegrass varieties as defined in 3876.2C.
- Lawn sod shall have a lush appearance, be dense, have a uniform texture, and bright in color throughout. The sod shall not contain grass with blade widths of 5 mm (0.2 inch) or greater. The sod shall be weed-free and shall contain no more than 5 mm (0.2 inch) of thatch over the base soil. The sod shall consist of a blend of 4 or 5 fine leafed turf grasses.
- Strongly rooted pads, capable of supporting own weight and retaining size and shape when suspended vertically from a firm grasp on upper 10 percent of pad.
  - Grass Height: Normal.
  - Strip Size: Suppliers Standard.
  - Soil Thickness: Uniform; 1 inch plus or minus 1/4 inch at time of cutting.
  - Age: Not less than 10 months or more than 30 months.
  - Condition: Healthy, green, moist; free of diseases, nematode and insects, and of undesirable grassy and broadleaf weeds. Yellow sod, or broken pads, or torn and uneven ends will not be accepted.

Erosion Control Blanket

- Category 2 Erosion Control Blanket in accordance with MnDOT Standard Specification 3885 - Erosion Control Blankets, and as described below:
  - Straw 1S (netting on one side).
  - Meet the criteria specified in MnDOT Standard Specification Table 3885-2.

Observations

- Observe that the Subcontractor uses an approved source of water. Water may not be used from the residence.
- Observe the Work described in Section 32 91 13, Topsoil Preparation, is completed before starting Work of this section.

- Observe Work begins within 2 days of topsoil preparation and is completed within 4 day following completion of topsoil preparation.
- Observe that the soil is prepared by loosening topsoil to a minimum depth of 3 inches.
- Observe that prepared areas are restored to specified condition if eroded or otherwise disturbed after preparation and before planting.
- Observe that the seed or seed/fertilizer mixture shall be emptied within 1 hour after the seed is added to the tank.
- Observe that a tracer is added to the water in the hydroseeder tank to visually inspect the uniformity of the seed application.
- Observe that sod is only placed when directed by the Contractor.
- Observe that erosion control blanket is applies to areas with greater than a 1V:3H slope. The blankets should be placed on the specified areas within 24 hours after sowing of the seed on that area.
- Observe that the blankets are placed parallel to the direction of water flow, with the netting on top.
- Observe that adjacent strip edges overlap each other at least 102 mm (4 inches). Strip ends shall overlap each other at least 178 mm (7 inches).
- Observe that a satisfactory 70 percent stand of grass is established and growing in place in a live, healthy condition after the 6 week watering period.

Trees, Shrubs, and Perennials (32 93 00)

Submittals

Action Submittals

- Plant materials source list
- Product data on manufactured products specified

Informational Submittals

- Maintenance data
- Guarantee

Tests

- Topsoil Analysis/Testing: As specified in Section 32 91 13, Topsoil Preparation.

Products

Plant Materials

- Provide quantity, size, genus, species, and variety of trees, shrubs, and perennials indicated on the plant inventory completed during the Residential Preconstruction Meeting.
- Quality and Size:
  - Ball & Burlap Plants: Firm, intact ball of earth encompassing enough of the fibrous and feeding root system to enable full plant recovery.

  - Container-Grown Plants: Self-established root systems, sufficient to hold earth together after removal from container, without being root bound.
  - Replacement Trees, Shrubs, and Perennials: Same species and quantity as specified for plant being replaced except:
  - Existing trees larger than 4-inch caliper may be replaced with 2-inch caliper trees.

Antidesiccant

- Foliguard®
- Wiltpruf®
- Other approved equivalent

Staking and Wrapping Materials

- Wood Stake: 2 inches by 2 inches by 8 feet
- Guy Wires: Galvanized, 12-gauge, ductile steel
- Hose: Two-ply, reinforced rubber garden hose, not less than 1/2-inch diameter, new or used.
- Tree Ties: No. 4 chain lock tree ties as manufactured by Green Brothers, Ltd.
  - Wrapping Material: Heavy crepe paper
  - Burlap: Of first quality, minimum 8 ounces in weight, not less than 6 inches nor more than 10 inches in width

Mulch

- Recycled hardwood (chipped or shredded), free from noxious weed seed and foreign material harmful to plant growth.

Peat Moss

- Natural residue formed by decomposition of reeds, sedges, or mosses in a freshwater environment, free from lumps, roots, and stones.
- Organic Matter: Not less than 90 percent on a dry weight basis.
- Moisture Content: Maximum 65 percent by weight at time of delivery

Herbicide

- Eli Lilly and Co.; Surflan®
- Thompson-Hayward Chemical Co.; Casoron®
- Other approved equivalent

Planting Soil Mix

- Proportion by Weight: 3/4 approved type B topsoil with 1/4 approved organic matter (peat moss).

Fertilizer

- Commercial, complete, of neutral character
- Granular, packet, or pellet form
- 35 to 80 percent of nitrogen slow release

- Minimum: 10 percent available nitrogen, 3 percent to 5 percent phosphoric acid, and 3 percent to 5 percent soluble potash
- Organic fertilizer when requested by property owner and as directed by the Contractor.

Observations

- Observe that plants are covered during shipment with a tarpaulin or other suitable covering to minimize drying or ship in box van.
- Observe that trees, shrubs, and perennials are planted after final grades are established and before seeding of lawns or grasses.
- Observe that replacement plants are free of dead or dying branches and branch tips, and bearing foliage of a normal density, size, and color. Closely match new plants to adjacent specimens of the same species and meet requirements of this Specification.
- Observe that watering, pruning, cultivating, and weeding are performed as required for healthy growth.
- Observe that stake and guy supports are maintained and repaired to reset trees and shrubs to proper grades or vertical position as required.
- Observe that new plantings are placed in same location as removed plant unless otherwise directed by Contractor.
- Observe that no planting, except ground cover, is located closer than 18 inches to pavements, pedestrian pathways, and 36 inches to structures unless replacing plant that was previously located there.
- Observe that amendments and fertilizer in ground cover beds are mixed with top soil prior to placing or apply on surface of top soil and mix thoroughly before planting. The top soil should be scarified to a depth of 4 to 6 inches.
- Observe that ground cover beds are established to final grade and raked to smooth and create uniform texture and fill depressions.
- Observe that amendments and fertilizer are not mixed if planting will not follow preparation of planting soil within 2 days. For pit and trench type backfill, mix planting soil prior to backfilling and stockpile at Site.
- Observe the following planting requirements for Trees, Shrubs, and Perennials:
  - Pits, Beds, and Trenches: Excavate with vertical and scarified sides.
  - B & B Trees and Shrubs: Make excavations at least twice as wide as root ball.
  - Container-Grown Stock: Excavate as specified for B & B stock, adjust for size of container width and depth.
  - Bare-Root Trees: Excavate pits to a width to just accommodate roots fully extended and depth to allow uppermost roots to be just below original grade.
  - Fill excavations with water and allow to percolate out prior to planting.
- Observe that replacement plants are planted in accordance with requirements of the specifications.
- Observe that the rootball is not covered with soil. Form a saucer above existing grade, completely around the outer rim of the plant pit.
- Observe that trees are supported immediately after planting to maintain plumb position.
- Observe that planting beds and area of saucer around each plant are covered with 3-inch thick layer of selected mulch within 2 days after planting. Saturate planting area with water.

- Observe that plantings are maintained in a weed-free condition during maintenance period. Apply pre-emergent selective herbicide to mulched beds at manufacturer's recommended rate of application.